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Established 1914

CHEMICAL INDUSTRIES

Vol. 41 Aug. 1937 No. 2

Published monthly and entered as 2d class matter Dec. 22, 1934, at the Post Office at New Haven, Conn., under the Act of March 3, 1879. Subscription, domestic and Canada, $3 a year; foreign, $4.

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The Reader Writes:—

Welcome the Guests

I am not "slamming" you when I say the "guest editorial" in your July issue is one of the best you have ever published. Sir Ernest Benn has hit the very bull's-eye of what should be the target of all efforts by sane progressives here and in England—namely, to get government out of the business of competing with its own taxpayers as producers of wealth and distributors of philanthropy. I have agreed with many of your own courageous editorials apropos the present political hodge-podge in this country and want to take this opportunity to thank you for them. You voice the sentiments of the soundest and most successful men in our industry and deserve to be recognized as our spokesman.

New York — H. E. Richards.

How Many Alcohol Sources?

The intensely interesting abstract of the papers at the Farm Chemurgic Council on power alcohol together with the drawing of Jacob Christian Schäffer both in your July number suggest to me the thought that someone ought to make a collection or a list at least of all the materials from which man has fermented alcohol. Data on yields would be intensely valuable. Cost figures would be most illuminating especially at this time. There is no charge for this suggestion.

Canton, Ohio — Henry Wheeler.

Wanted—A New Word

We badly need a word to distinguish between insecticides used in the home and on the farm. The adjectives usually employed, namely, "household" and "agricultural," are clumsy and, if they are omitted as frequently happens, are apt to be confusing.

With no hope of rivalling Dr. Hale as a chemical word coiner, may I very humbly suggest the word "pesticide?"

Used to denote the household insecticide, it has the advantages of being short and descriptive and already in use in England. Its general adoption would leave the word insecticide alone and so not apt to be misunderstood in the agricultural field.

If you think well of this suggestion, please print this letter and adopt at once "pesticide" in your own most interesting columns.

Richmond, Va. — P. E. Wilcox.

"Goofy Chemistry"

Your older readers will doubtless remember the amusing nature faker articles which used to emanate from Winsted, Conn. It must have been the son of that witty correspondent who wrote the editorial in a recent issue of the *Winsted Citizen* entitled "Chemicals and Character." He pokes such good natured fun at the psychologist who has discovered that people's personalities are governed by the dominant chemicals in their physical makeup, and I think you will find room for some of the following quotations:

"Calcium, says the psychologist, makes the 'strong, silent man,' the kind who says little but accomplishes much. Calcium people are good engineers and can't stand liars. We don't know why.

"Carbon people are lazy and dull, inclined to plumpness. Women of this group may look charming while they are sitting still, but they waddle when they walk. And a lot of them will never forgive the psychologist for that crack.

"The oxygen people are friendly and optimistic, good talkers and mixers. They should excel as salesmen or politicians. Phosphorus people are a little queer. They believe in astrology, palmistry and fortune telling generally. Sulfur makes people emotional and unstable.

"There probably is no need to begin worrying about our individual types and how to change or develop them. Mostly our body chemistry takes care of itself pretty well, and when it doesn't it's better to consult a physician than a psychologist."

Hartford, Conn. — John Todd Black.

Another Look at "The Record"

In the June issue of Chemical Industries, Dalton M. Goetschius, Bergenfield, N. J., calls attention to an advertisement in May issue which incorrectly stated, "Thirty odd years ago T. S. P. was a chemical known only in the laboratory. It had no industrial use." Mr. Goetschius says this chemical was being sold in substantial quantities nearly forty years ago.

Let's keep the records straight. A 100 page booklet issued by Keystone Chemical Company, 3 South Front Street, Philadelphia, "A Comprehensive Treatise on Water Purification," describes the manufacture and use of T. S. P. in detail and carries many letters testifying to the use of T. S. P. in quantity. One such testimonial from Buckeye Buggy Company, Columbus, Ohio, addressed to Keystone Chemical Company, is dated April 7, 1882 (55 years ago). Another from Seamans Bank for Savings, 74 and 76 Wall Street, New York, N. Y., dated September 21, 1888 (49 years ago), testifies to the efficiency of T. S. P. used in their 25 H. P. boiler.

The schedule price on T. S. P. in those days was 16½c per pound in barrel lots and 14½c per pound in ton lots.

New York — A Subscriber.

Note—We do not print unsigned letters on this page, but the above is of extraordinary interest and not (like many anonymous communications), scurrilous or debatable.—Editors.

Taxes! Taxes!! Taxes!!!

Keep pounding away at the tax situation and give us more of the out of the ordinary features such as you had in your "We" page last month in the experiences of Merrimac and Houghton.

Of all the many taxes we must pay today, the most wicked is the Federal tax on undistributed earnings. This is so because of its dangerous effects which, most unfortunately and certainly contrary to all of the New Deal protestations, falls heaviest on the shoulders of the smaller companies. Unless it is amended so that we can get credit for earnings spent for both replacements and expansion, which are impossible to be paid for out of the reserves for depreciation allowable under the Frederick Income Tax, this law will prove a millstone around the neck of many smaller manufacturers. As the *New York Times* says on July 14 in an editorial about this law, it can be tolerated only if you think the most important function of a corporation is to pay taxes.

Brooklyn, N. Y. — T. McM. Moore.

Ethyl Acetate

. . . the most widely used nitrocellulose solvent—is obtainable in three grades from Carbide and Carbon Chemicals Corporation.

ETHYL Acetate shares with isopropyl acetate the distinction of having the highest petroleum hydrocarbon dilution ratio of all ketone or ester solvents of equivalent evaporation rate. Ethyl Acetate is a fast-evaporating, powerful solvent for making lacquers, thinners, leather dopes, varnishes, photographic films, pyroxylin plastics and a host of other compounds. Manufacturers of these products have a wide choice in three grades of Ethyl Acetate produced by Carbide and Carbon Chemicals Corporation.

Warehouse stocks of Ethyl Acetate are maintained at industrial centers to supplement the prompt shipments of tank cars and drums from South Charleston, West Virginia. Your inquiries will receive immediate attention.

SPECIFICATIONS 85-88% Grade

Acidity (acetic)	Not more than 0.01%.
Color	Water-white.
Purity	85 to 88% (by wt.)
Specific Gravity	0.883 to 0.888 at 20/20°C.
Boiling Range (760 mm.)	Below 70°C—none. Above 80°C—none. Not more than 10% distills below 72°C.
Dryness	Miscible with 19 vol. of 60° Bé gasoline at 20°C.
Average Weight	7.37 lb. per gal. at 20°C.

Specifications for the 95-98% grade and specifications for the 99% or "Acetic Ether" grade which meets U.S.P. requirements will be sent on request.

CARBIDE AND CARBON CHEMICALS CORPORATION

Unit of Union Carbide and Carbon Corporation

UCC

30 East 42nd Street, New York, N. Y.

PRODUCERS OF SYNTHETIC ORGANIC CHEMICALS

LOOK

here are those sparkling crystals...

For over twenty-eight years the name Natural has been more than just another trade name for bichromate. It has stood for the highest grade of product, for continual improvement in quality control and for progressive plant development to meet constantly increasing demands.

Natural BICHROMATES

Natural Products Refining Co., 904 Garfield Ave., Jersey City, N. J.

CHEMICAL INDUSTRIES

The Chemical Business Magazine

Destroyer or Creator

Financial opinion of the chemical industry has undergone two important revisions within the past twenty years. Really first-class financial brains function quite differently from the thinking of an average man — a difference which the first Rothschild defined as the mental habit of considering ten cents as ten per cent. on one dollar for one year or merely a "dime". The penny squeezing idea is but a very small part of this distinction between financial and popular thinking, and reasoning that is instinctively based upon appraisal and reaches profit-or-loss conclusions, has in the broadest sense been valuable to mankind.

Two short decades ago the American financial community regarded the chemical industry with almost complete indifference. The World War thrust the industry into the spotlight and during the boom period it sought public money for its corporate consolidations and operating expansions. Its high, rapid obsolescence of both processes and products; its ruthless competition against established methods and natural materials, won it a bad name among financiers as a destroyer of values. Today in financial circles chemical manufacturing is held up as an example of creating new values through practical use of technological advance. This idea is beginning to filter through and tincture popular thinking about the chemical industry. No doubt it will be overdone.

It is a pity, however, that more of this appraisal—profit reasoning did not govern the writing of the report of the President's Natural Resources Committee. This is a voluminous and valuable study marred by a revival of the dead notions of technocracy and a good deal of wishful thinking that by freeing nations of geographical dependence upon raw materials, modern industrial technique will outlaw the cause of war. Chemistry plays a leading rôle here, but any realistic consideration of either technological unemployment or synthetic raw materials by one familiar with this industry would confirm neither these fears nor these hopes.

Williams Haynes, Publisher, A. M. Corbet, Publication Manager; W. F. George, Advertising Manager; D. O. Haynes, Subscription Manager; J. H. Burt, Purchaser.

Clarifying the Patman Law

The four Robinson-Patman decisions published July 19 by the Federal Trade Commission clarify greatly the uncertainties which have plagued honest sales and purchasing executives as to how this ambiguous law might be interpreted and administered. In the first place, it is evident that the Commission appreciates that differences in selling costs are real and can be established in court as proven fact. Secondly, it is made quite plain that no substitution of quality or subterfuge of quantity to justify price differentials is to be tolerated.

Administration of the law in this spirit is fair and logical, but the arbitrariness of this badly drawn legislation crops out in the decision on brokerage commissions. Here the theory is clear enough, though the practice is muddied. In workaday business discounts and brokers' fees—both based on quantity orders which effect real saving in sales costs—appear to be in effect remarkably similar; but they are vastly different in the terms of the Robinson-Patman Law. Such verbal distinctions are the more inconsistent because in the Biddle case the net result was to give scattered buyers the advantage of cooperative purchasing, a practice specifically encouraged by another section of the law.

The Commission is justified in interpreting the law strictly in accordance with its own terms even when these terms lead to illogical conclusions. At least, it is something to know definitely that this will be the rule and industry can govern itself accordingly. The Federal Trade Commission in these decisions has again performed with true distinction an exceedingly difficult and yet necessary service.

State Government and Chemical Industry

Almost imperceptibly the relationships between the various state governments and the chemical industry have been changing; and while the new legal interpretation of interstate commerce has in one direction lessened the importance of the states, still in other ways state authority and influence have greatly increased. State labor boards, state old age pensions, state control of waters, state factory inspection, state labor laws, state taxes, all loom up bigger and bigger in the thoughts of any major chemical executive.

The decentralization of the industry means the scattering of new plants in virgin chemical territory and makes these questions of state relationships to industry serious elements in expansion programs. A few states—Louisiana is a notable and well publicized example—show appreciation of this change and with all the wiles of an enthusiastic Bingtown Booster Club are angling to locate new manufacturing enterprises within their boundaries.

The implications of these changes are discussed in this issue by Charles Penrose, a distinguished engineer who has specialized in transportation and whose hobby is historical economics: an unusual combination of qualifications for such a discussion. Only an overwhelming inferiority complex can prevent any person who has any active connection with the American chemical industry from agreeing with four out of five of Mr. Penrose's conclusions.

Our Guest Editorial

Frank Kent of the *Baltimore Sun* has "covered politics" for that famous Democratic newspaper for thirty-nine years so he knows whereof he speaks when he writes in his syndicated column:

> One of the basic reasons those so constituted that they require facts to bolster their faith have so profound a distrust of this Administration is because of the great difficulty of getting from it solid reliable, accurate information about its fiscal affairs.
>
> Sometimes the searchers after facts are baffled by the reluctance of the bureaucrats to divulge figures and by the ability of some to juggle them. But more often the information is not obtainable because it is not available. This unreliability is not confined to the emergency agencies but extends to the regular departments as well. It is doubtful whether there has been a period when Treasury reports were so misleading, or statistics and estimates concerning federal finances so unstable. The President presents one set of figures; the Treasury follows in less than a week with another set. Roseate hopes are held out that federal solvency is about to be restored. Six months later it is discovered that the debt and deficit have increased and there is literally no control over expenditures.
>
> Every six months finds us deeper in the red, but every six months we are told that the time has now arrived when through reduced expenditures and increased revenue, control over our finances will be regained. This talk about economy comes regularly from the President, but just as regularly nothing is done.

Specifications Made to Order

Pioneering in a New Plastic of Definite, Predetermined Properties

By A. E. Pitcher

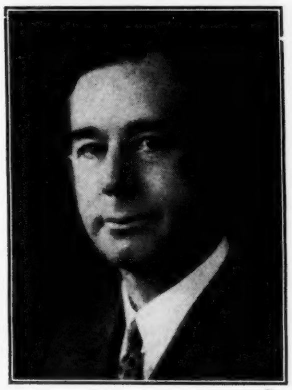
General Manager, Plastics Department, The du Pont Company

EVERY synthetic material enjoys certain advantages in competition with its natural rivals. A synthetic is always uniform in composition. A natural product forever varies.

Because its physical and chemical characteristics are constants, the properties of a synthetic material are always the same. Because in nature variation is universal and continuous, the properties of any natural product must of necessity always be to some degree abnormal. Synthetic indigo, for example, is a chemical entity and the only standardization necessary is its tinctorial strength. The dye made from natural indigo varied not only due to the variation inherent in the individual plants, but also due to differences in distinct strains and the subtle influences of soil and climate, so that standardization, even when carefully done by the best methods, was a tricky, tedious operation and the results not always an unqualified success.

This uniformity means constant quality which means much to the consumer. From this uniformity, with greater manufacturing experience, follows often a higher quality and with larger production, usually a lower price. Moreover, from this uniformity comes an advantage for the synthetic material which I want to emphasize since it is of chemical rather than an economic origin. This is the advantage of modifying the chemical characteristics of a synthetic to meet specific purposes. A manufacturer using a natural raw material must, in the language of the street, "take it and like it". A chemist, on the other hand, can often make a synthetic product of definite properties to the consumer's order.

The distinctive chemical and physical characteristics of nitro-cellulose, cellulose acetate, and a host of synthetic resins, for example, enable the coatings manufacturer to supply highly specialized materials to the makers of dolls and dry-docks, rubber balls and refrigerators. Indeed, the modern refrigerators have one type of coating on the inside and quite a different one on the outside. Widely different, yet extremely exacting conditions of use are served by distinctive synthetic materials peculiarly adapted for those uses. Research aimed to produce synthetic materials of new chemical and physical characteristics is not new, but it is certainly one of the most modern applications of chemical skill and knowledge.



How research, both chemical and commercial, combine to produce a new plastic material, tailor-made to have physical and chemical properties not till now displayed by any synthetic material, is told by Mr. Pitcher.

A very fine example of this type of research has resulted in the newest addition to the field of plastics. This particular plastic was originally introduced by the du Pont Company under the trade name Pontalite. Later, it was changed to Lucite and that trade name identifies this product at the present time. Chemically, Lucite is known as a methyl methacrylate polymer. It is manufactured in the form of sheets, rods, tubes, molding powder, and cast blocks.

Our research work started out with the objective of developing a plastic which possessed certain new, unique and superior qualities over any other plastic. After we were reasonably well advanced in our development work, we made some very interesting discoveries in the characteristics of Lucite which led us to believe that it might have possible applications in some of the scientific fields outside of and remote from the ordinary industrial uses of plastics. We then decided to add a second objective to our research—a program of pioneer work in this new plastic which we hope might make a contribution to humanity through medical, surgical, dental and optical science.

Space will not permit of any comprehensive outline of all and probable uses of this new plastic in the industrial and scientific fields, and therefore, in selecting a single phase of this development for discussion I have chosen the pioneer work we are undertaking in the field of pathology. This is more novel to CHEMICAL INDUSTRIES' readers than the more familiar work of promoting the use of a new product in the industrial field. Let me, therefore, merely mention the fact that Lucite is expected to have literally hundreds of uses in a wide variety of commercial fields, some of which are illustrated herewith—see new Products and Processes insert.

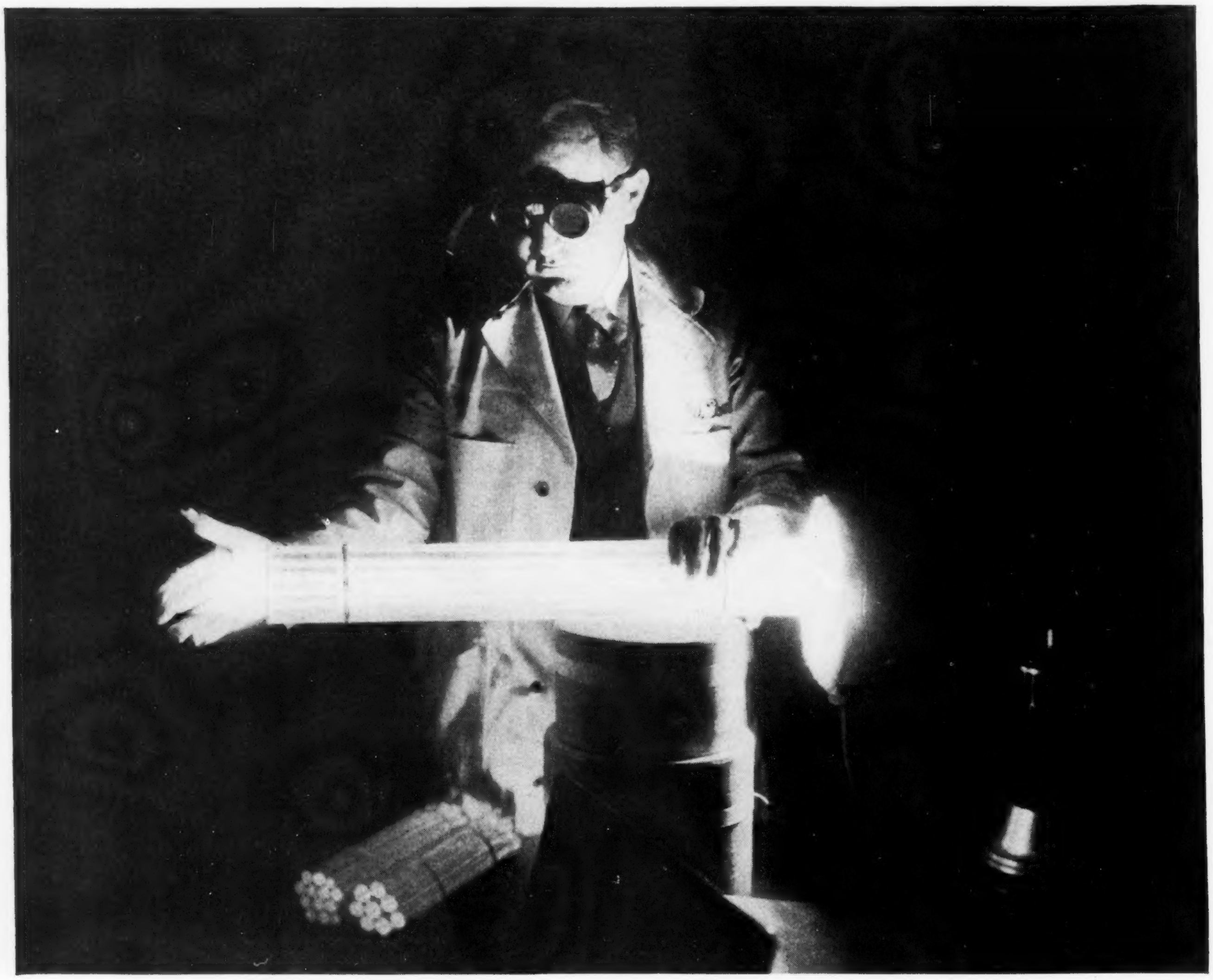
A word about the product itself: This sparkling, gleaming and beautiful product originates from coal and petroleum —crude and dirty coal and petroleum. By taking derivatives of these products and carrying them through approximately 30 processes, we get a resulting product chemically known as "methyl methacrylate monomer." This represents the first stage in the production of Lucite. We convert this in the second and final stage—

polymerization. A comprehensive definition of polymerization is very technical and involved and I will not undertake to give it. The monomeric form, about the consistency of water, is made up of individual molecules which, like dry sand, will not unite into a solid mass in their present state. Through the use of a catalyst and heat in certain original mechanical devices, developed especially for this process, we create a condition under which these molecules will unite and form a solid mass. Completely polymerized it becomes Lucite, another example of Nature's crude materials being transformed into a new, beautiful and useful product. The time and effort to complete this development from the first test tube experiments to the perfection of a process adaptable for use on a commercial scale, according to our best estimate, required the continuous services of from twenty-four to twenty-eight men over a period of five years.

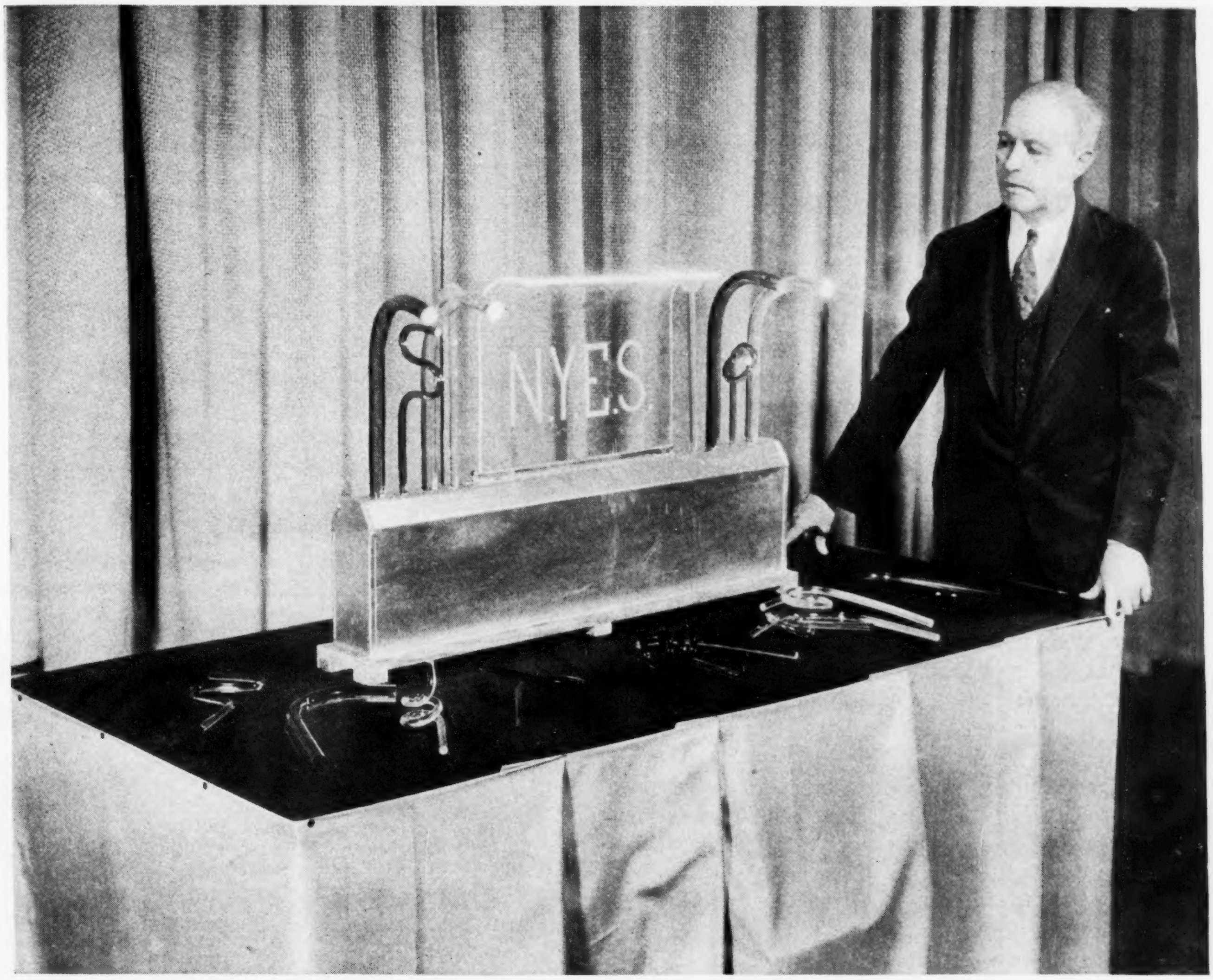
In the pioneer work which we are undertaking with this new plastic, we have held many consultations and received much encouragement from scientists in the field of pathology. The opinion has been quite universally expressed that if we could duplicate many of the outstanding virtues of rock crystal and at the same time overcome some of the weaknesses which restrict its use, we would make a contribution which would greatly aid medical science. Quoting a paragraph from a letter recently received from one of the outstanding medical research institutions in the country:

> "The Department of Pathology is quite eager to obtain a material as a substitute for quartz in some delicate experiments that it wishes to carry out. As quartz is so expensive in the form desired, we have not purchased it."

The letter then goes on to describe a certain type of article which we are requested to furnish for further experimental work. Several outstanding departments of pathology, as well as many individual scientists working in the medical field, are now active in experimental work with a view of utilizing Lucite to advan-



Above demonstration shows the phosphorescence of Lucite. A rod of Lucite exposed in front of a mercury vapor ultra-violet lamp for one minute absorbed the ultra-violet rays. The demonstrator then waved the rod in the air, and for at least ten seconds a brilliant blue-green phosphorescence shone in the dark. Demonstration was to emphasize the fact that research may develop characteristics and qualities for which no purpose is now known, but which may prove in the future to be of inestimable value.



Lucite transmits light around bends as shown in this demonstration. Electric light bulbs were placed in the box on the table, below the rods and sheet of Lucite. The light travels through the material, appearing only at the end of the tubes, on the edge of the sheet, and the engraved section, N. Y. E. S. Quartz also possesses this property of edge lighting

tage, and this letter is quite typical of the attitude of most of those with whom we are working.

We have, therefore, concentrated in our development work of late in attempting to maintain the outstanding virtues of rock crystal and, at the same time undertaken to overcome the weaknesses which limit the utilization of this material in the medical field. Accordingly, a comparison of the qualities of rock crystal and Lucite is rather illuminating.

First, as to weight: Lucite is approximately one-half the weight of rock crystal. Putting it in another way, the cubic content of the Lucite in one pound is twice the amount of crystal. This feature will assist in reducing cost as compared with crystal, and may be quite advantageous in some respects in the practical application of this material for uses by medical and pathological institutions.

Now—strength: A sheet of Lucite ¼″ thick, 20″ x 20″ in size, supported on four corners, carries a man who weighs 210 lbs., thus, while the specific gravity of this material is one-half of rock crystal, strength has not been sacrificed because of this quality. For all practical purposes Lucite is not fragile and not breakable; from this standpoint it will stand up under very severe tests.

Now—clarity: It has been demonstrated that Lucite is by far the clearest transparent plastic developed commercially to date. It possesses a higher degree of clarity than ordinary plate glass. It is even clearer than optical glass. Experiments making an accurate and scientific comparison of the clarity with rock crystal have not been completed but as far as we have gone the indications are that Lucite is as clear as rock crystal. Herbert Thompson Strong, of New York City, an expert on rock crystal, who is also making comparisons, informs us that while his tests are not completed, thus far they, too, indicate that Lucite is equal in clarity to rock crystal.

Lucite will absorb and transmit ultra violet rays. Rock crystal will transmit ultra violet rays 100%; in all wave lengths Lucite is capable of transmitting about 75% of the ultra violet rays within the wave band used to treat certain diseases. The extent to which Lucite will transmit these rays, even though somewhat limited,

promises to make it useful in certain medical fields. Lucite absorbs and throws out ultra violet rays and the suggestion has been made by some physicians that it may be possible to treat internal organs of the body with pieces of Lucite exposed to ultra violet rays.

A comparison of the refractive qualities of Lucite and rock crystal can be made by placing a piece of each material side by side, each over a light covered with revolving colored lenses. The piece on your right is rock crystal, the piece on your left is Lucite. Because rock crystal is fragile and brittle it has many facets and fractures for the light to play upon. Because Lucite is not fragile and brittle it has been difficult to develop the sharpness of the facets and fractures of rock crystal, nevertheless Lucite has substantially the same optical and refractive qualities as rock crystal. Both materials act about the same under the projection of various colored lights. The light does not penetrate Lucite or rock crystal as it would in the case of glass but it is reflected from the fractured surfaces. The light rays combine to form the secondary and tertiary colors. Light may be transmitted through Lucite sheets and rods without being reflected through the sides. Insofar as we are aware, rock crystal is the only other solid material that functions in a similar manner. What practical value can be made of this quality? We do not know definitely, but it has been suggested that Lucite rods might be shaped to illuminate certain interior parts of the body in surgery. The illumination would be cold, as the source of the light would be at the end of the rod and the heat absorbed before the light travelled through it. The rod would be unbreakable and could be shaped to fit into the most difficult recesses. This is one of the qualities in which pathologists are very much interested.

Comparisons and Conclusions

Rock crystal is exceedingly hard and will withstand high temperature. Lucite is a thermoplastic material with a relatively soft surface and a low softening point. In some respects the surface hardness and softening point will handicap the use of Lucite; in other respects it will aid it.

To briefly summarize the comparative qualities of Lucite and rock crystal: Lucite is about one-half the weight of rock crystal; it is much stronger and for all practical purposes is unbreakable; tests to date indicate that Lucite is as clear as rock crystal, although this has not been scientifically demonstrated; Lucite will transmit about 75% of ultra violet rays, used for the treatment of diseases, whereas rock crystal will transmit 100%; Lucite has substantially the same refractive and light transmitting qualities as rock crystal; while rock crystal is hard, fragile and very difficult to fabricate into appliances used in pathological examinations; Lucite has excellent working qualities and can very readily be produced in almost any desired shape or form; we will be able to supply Lucite at a small fraction of the prevailing cost of rock crystal.

Names of the Month—

A Current Supplement to the Chemical Who's Who

ANTHES, John Frederick, asst. to chf. chem., Brooklyn Union Gas Co.; b- N. Y. City, 24 Sept. 1895; mar. Rena Jane Sottong, Barrytown, N. Y., 9 Sept. 1922; educat., Polytech. Inst., Brooklyn, Ch.E. 1918, Am. Leather Res. Lab., asst. dir., 1919-20; British-Am. Chem. Corp., res. asst. 1920-21; Brooklyn Union Gas Co., asst. to chf. chem. 1921 to date. Memb. of Fifth Engrs. Training Corp., C.W.S. 1918. Res. on gas meter diaphragms and dressings, corrosion problems and various investigations to improve methods of test used in gas industry. Memb. A.C.S.; Am. Gas Assn. (chmn. chem. com.); A.S.T.M.; A.I.C. Hobbies: baseball, tennis, reading. Address: Brooklyn Union Gas Co., 191 St. James Place, Brooklyn, N. Y.

COLLINS, Grellet N., paper making; consulting work; b- Philadelphia, 17 Mar. 1893; mar. Martha Hord, Overbrook, Pa., 25 June 1919, 2 sons, 1 dau.; educat. Penn Charter Schl. 1910; Princeton, B.S. (Chem.) 1915. Visited paper mills in Eng., Scotland, Germany, 1909; Dill & Collins Co., 1915-17; v-p. in chg. mfg., 1919-28; Bryant Paper Co., mgr. sales serv., production mgr. in chg. mills, 1928-29; International Paper Co., div. mgr. 1929-35. U.S.N.R.F., Ensign 1917-19. Devel. Collins pulp bleacher, patented reverse flow screen. Memb. T.A.P.P.I. Clubs: Tiger Inn (Princeton). Hobbies: sailing, fishing, golf. Address: 6 Overhill Road, Scarsdale, N. Y.

FRENCH, C(harles) Clement, Dean of Coll., prof. chem., Randolph-Macon Woman's Coll.; b- Philadelphia, 24 Oct. 1901; mar. Helen Augusta Black, Washington, D.C., 25 Dec. 1925, 1 son, 1 dau.; Univ. Penn., B.S. in Ch.E. 1922, M.S. 1923, Ph.D. 1927. Univ. Penn., asst. in chem. 1922-23, instr. chem. 1923-30; Randolph-Macon Woman's Coll., prof. chem., hd. dept. 1930 to date, acting dean Aug. 1936-Jan. 1937, dean Jan. 1937 to date. Memb. A.C.S.; A.A.A.S.; Va. Acad. Sci.; Sigma Xi; Tau Beta Pi; Alpha Chi Sigma. Address: Randolph-Macon Woman's Coll., Lynchburg, Va.

WESTERVELT, William Young, consult. engr.; b- Jersey City Hgts., N. J., 30 July 1872; mar. 1. Mary Westervelt Young, N. Y. City, Sept. 1900 (dec'd); 2. Henrie Whiting McIlwaine, Knoxville, Tenn., 27 July 1929; educat., E. M. Schl. of Mines (Columbia) 1894. Ducktown Sulphur, Copper & Iron Co., chem., surveyor, engr. and supt. mines 1894-98, consult. engr. 1898, responsible for devel. of Ducktown Co.'s mines to 1923; Anglo-Am. Copper Co. of London, consult. engr. 1905, and developed the Ray (Ariz.) property to the point of sale to present owners; Grasselli Chem. Co., apptd. consult. engr. 1909, and developed and organized its New Market (Tenn.) zinc property, also valued for first bond issue, the Butte and Superior Mines, Butte, Mont.; examined New Lymni, Ltd., copper mines, Island of Cyprus, in Mediterranean Sea 1910; Copper Pyrites Corp. of Ducktown Mining Dist., Tenn., organizer and pres. 1919, in 1927 purchased control of Ducktown Chem. & Iron Co., for Ducktown Pyrites Corp. which in turn he organized as constituent of Copper Pyrites Corp., and was pres. of all three cos. until sale in 1936. War Mineral Com., chmn. 1917-18. Author of various arts. on mng. in tech. jls. and of section of Mine Examinations, Valuations, and Reports in Peele's Mining Engineer's Handbook. Memb. A.A.A.S.; Royal Soc. of Arts (London); A.I.M.& M.E.; Mining and Metall. Soc. America (v-p. 1920-22); Amer. Electrochem. Soc.; Amer. Mining Congress; Holland Soc. Clubs: Century, City, Columbia University, Nat. Arts, Drug & Chem. (N. Y.), Arts (Washington); Royal Societies (London). Address: 522 Fifth Ave., N. Y. City.

Charles Penrose Discusses

Chemical Industry and the Forty-Eight States

MORE than three hundred years ago when John Winthrop, Jr. laid the cornerstone of your great industry, he could not have dreamed of the complexities which would beset his successors who make chemicals today. The eleventh year of the reign of His Most Gracious Majesty Charles I contained no hint of the problems—social, political and economic—you must solve in the midst of our supercharged streamlined civilization.

Winthrop's sole "overhead" was his roof. "Depreciation reserves" troubled him little since his chief apparatus was an open iron kettle and he produced alum and saltpetre by processes perfected long before his day and used years after his death, so he did not have to figure "obsolescence." His "surplus" was never great, but had it piled up to an enormous fortune his only need for a lawyer would have been to draw up a proper will.

His father kept a famous, voluminous diary, yet he records no injunction against the infant chemical enterprise for emitting noxious fumes. "Product competition" never worried the younger Winthrop, for neither cordite, nor blasting gelatin, nor T.N.T. disturbed the market for his gunpowder. In the Massachusetts Bay colony there was no factory inspection, no machinery tax, no 48-hour law.

Nevertheless within that tiny chemical plant we find in miniature and vastly simplified the germs alike of a great industry's economic position and of the relationship existing always between industry and the state. John Winthrop, Jr. undertook to manufacture saltpetre for gunpowder and to produce alum for the tanning of beaver skins. Weapons for defense and tools for other industries were the *raison d'etre* of his enterprise; and as Williams Haynes so clearly pointed out in his Brackett Lecture at Princeton last winter, these are today the chief economic functions of your modern chemical plants. So to you, I am sure, this aspect of chemical making need not be elaborated. But of the relationship between the American chemical industry and the forty-eight states there is something to be said that is timely and suggestive and yet that might easily escape the attention of busy technologists and executives, or even State Governors.

At Boston three hundred years ago American industry was getting a start, manufacture was coming into existence, and in that coming a relationship was being created: in a dual sense. First, a relationship between industry and the state viewed as a geographical unit endowed with natural resources, climate, location, population, accessibility, and all characteristics associated with geography. And secondly, a relationship between industry and the state viewed as a body politic, endowed with legislation, taxation, licensing, regulation, inspection, protective powers, and the multitude of functions that make up Government.

With the passing of years, progressive development of our natural resources has created this problem of dual relationship between industry and the state, a problem of accepted importance to all states and to every industry. Chemical raw materials are found in every state in the Union. Every industry is a customer of the chemical industries. These relationships are notably important to you.

Before attempting to analyze any subdivision there is advantage in taking a quick glance along the national horizon. Who of us would debate an assertion that the commercial position which the United States enjoys among the nations has been built up with the aid of the arts and sciences employed in the broad field of industry. We have become, since John Winthrop's days, a manufacturing nation. Founded upon abundant natural resources, through research and invention, human ingenuity and courage and vision, and a proper use of wealth, we have arrived at a point in our material development where we recognize *Mass Production*, *Standardization*, and *Quality* to be three of the broad marble steps leading up to the acropolis of industrial progress in America. Each of us profits many times a day, directly or indirectly, consciously or unconsciously, as we find ourselves mounting higher by the aid of those three broad steps.

Paradoxically, as industry has expanded, its geographical concentration has intensified. We call it "centralization." Today much is being said about "decentralization."

In the Department of Commerce at Washington, on the wall of an old friend's office, that is, in the office of Le Verne Beales, veteran Chief Statistician for Manufacturers—hangs a great map of the United States, in color. I am told it first was made for an international exposition and that no copies exist. That map has taught me more of the distribution and the present centralization of industry among our forty-eight states than could shelvesful of books.

Interpreted by statistics: the map denotes that out of 3,076 counties in the whole nation, ninety-seven counties comprising thirty-three industrial areas employ fifty-six per cent. of all wage earners and account for sixty-two per cent. of the total value of U. S. A. production.

Further, there are ninety-three cities in the United States with populations in excess of 100,000. Of these, fifty are situated in these ninety-seven industrial counties.

Proceeding with the analysis: the Washington map also shows that 155 counties, in each of which 10,000 or more wage earners were employed, accounted for nearly 71 per cent. of all wage earners and about 75 per cent. of the value of the entire country's production. Out of the 3,076 counties, only 155, or about 5 per cent. of the counties in the United States, employ over 70 per cent. of all industrial wage earners. Undoubtedly these figures are familiar to many of you. Assuredly they make a striking picture of this centralization.

Note this interesting collateral fact, still speaking of the Nation as a whole: in spite of population movement, in spite of changes in manufacturing arts and processes, shifts in industry from one section to another, notably the shift of textiles from New England to the South, and in spite of decline in some industries and the birth of new, yet the above relationships have continued to exist since 1899.

What circumstances and forces have brought about this intensified centralization concentrated in areas where dwell little more than third of our national population? Many factors have contributed. Historic beginnings; geographical location; individual initiative; raw materials; population and labor supply; power resources; markets; climate; and tradition have contributed—and not the least of these is tradition. Above all, there were outstanding individuals with an idea; a man who believed in his community, in his goods, in himself; and saw how he might assemble raw materials and convert them into finished products. Witness rubber at Akron, pipe at Reading, furniture at Grand Rapids, hats at Danbury, gloves at Gloversville, shoes at Brockton, automobiles at Detroit, steel at Pittsburgh—and do I need to remind you of Niagara Falls or Midland or Charleston or Carteret or Marcus Hook?

From whatever causes, industrial centralization is with us and for years has been recognized as a problem both by the management of industry itself and by the social scientists.

Of late, Government has taken an interest and the issue has been recrystallized. In his address to the Third World Power Conference, at Washington, September 1936, the President of the United States as reported in the public press had this to say:

> Now we have electric energy which can be and often is produced in places away from where fabrication of usable goods is carried on. But by habit we continue to carry this flexible energy in great blocks into the same great factories, and continue to carry on our production there . . . We are continuing the forms of over-centralization of industry caused by the characteristics of the steam engine, long after we have had technically available a form of energy which should promote decentralization of industry.

It becomes increasingly difficult to segregate the political and economical influences surrounding industry, so we may join them in consideration of decentralization as it concerns the chemical manufacturer. Like the miner, the farmer, and the fisherman, he is peculiarly tied to geographical considerations of plant location. His raw materials are often bulky and heavy, costly to transport yet inherently materials of low value per ton compared with his finished products. In spite of this we have seen of late a wide scattering of chemical production.

This chemical decentralization is favored by a number of potent influences. Most important of these is the decentralization of the chemical consuming industries.

Accordingly new sources of chemical raw materials are being developed: the salt of Louisiana and Texas being made into alkalies; petroleum by-products in Indiana, Oklahoma, California and New Jersey being converted into chemical products.

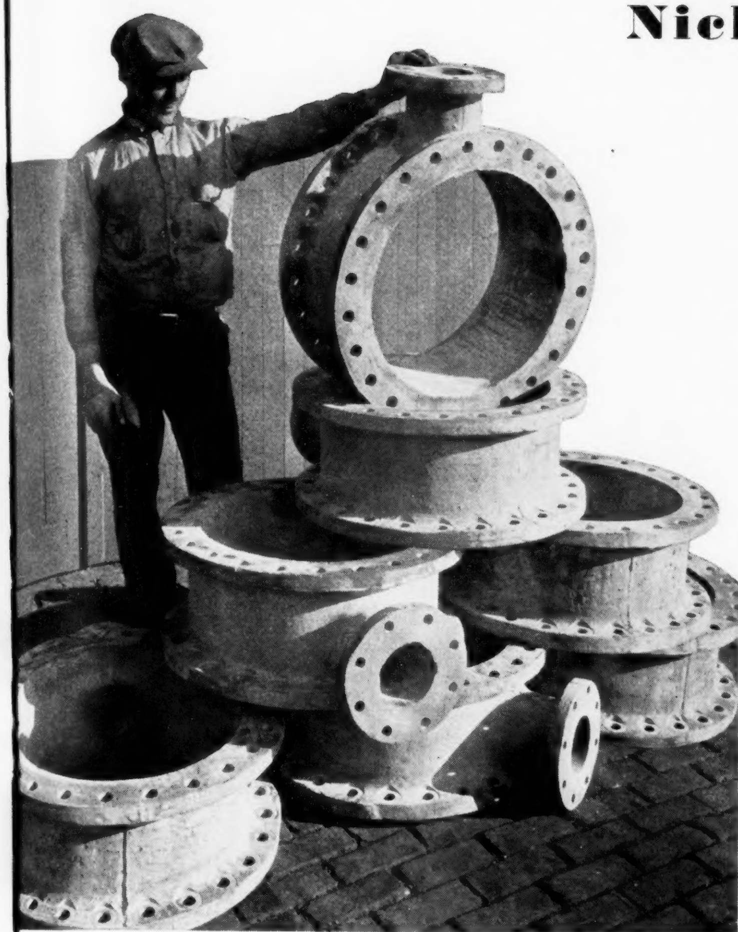
Above and beyond these strictly chemical considerations, forces of decentralization that are shoving many other manufacturers out of their established locations or inducing them to build branch plants, are also influencing the management of chemical companies. Local taxes, notably on equipment and sales; labor supplies, and the cost of power are here prime factors.

It is an exceedingly interesting fact that the cities are much more aware of the value of new industries to their local community than are the states. It would seem that the smaller political units, closer to their people, nearer to the economic battlefront, are more appreciative of the work created and the capital invested, and the efforts of innumerable Chambers of Commerce to locate new manufacturing enterprises bear testimony to this conviction. Yet, today, it is often state regulations and state taxes which are the chief stumbling blocks in the road of industrial progress, while in other instances state inspection and state protection are strong magnets for industrial developments. It is my guess that industry, seeking peace, stability, and reasonable opportunity, will flock to that state where it is known that every resource of Government will protect the right to work for the benefit of both parties to every labor agreement.

Do not accuse me of flattery if I add that were I asked by the governor of any one of the forty-eight states to suggest what he might do that would most benefit his commonwealth, I should say to him: "Do whatever you can to attract and foster chemical enterprises within your boundaries."

No other industry is more stable in its employment. Few other industries pay wages so high. You consume a wide variety of raw materials, some of which are found in every state. You give birth to and nourish all other industries. You are the ally of mine, quarry and farm. I suspect that you are *the* industries of the future.

Nickel Alloys



Various Types and Uses in Chemical Process Operations

By Robert J. McKay

Left, pure nickel provides rugged equipment for the ammonia oxidation process. Some nickel tees cast from this metal for a single installation; below illustrates an application to a rotary vacuum salt drier.

RESEARCH over the past several years has established that nickel alloys are resistant to the corrosive action of more than 350 products used in the chemical industries. It has also found that nickel protects the purity of hundreds of chemicals in course of manufacture. It follows that manufacturers of chemicals should know how, why, and where nickel is of importance to their business. This importance arises from the fact that nickel alloys not only combine mechanical properties superior to mild steel but are highly resistant to corrosion. They also possess favorable working qualities.

Four principal varieties of nickel alloys find application in the chemical industries:

(1) Low alloys containing up to 5 per cent. nickel. Offered in steels, cast irons and bronzes, they provide strength and toughness and improve the corrosion resistant quality indirectly.

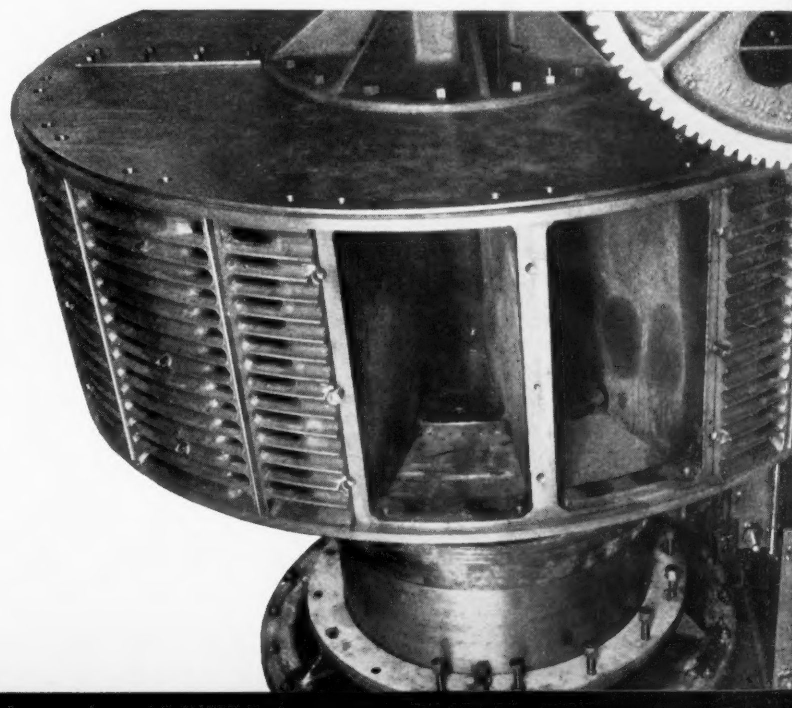
(2) Intermediate alloys containing from 5 per cent. to 25 per cent. nickel. Provided in nickel silvers, cast irons and stainless steels, these alloys add directly to the corrosion resistant quality of the material and provide beauty of appearance, strength and toughness.

(3) High alloys, containing 25 per cent. to 90 per cent. nickel. These are highly resistant to corrosion and impart strength and toughness combined with beauty. In this classification fall monel, a natural alloy of nickel and copper, and Inconel, a nickel-chromium combination.

(4) Pure nickel, containing more than 99 per cent. nickel, is produced in the various commercial shapes. This malleable nickel is used for cladding steel and other metals and pure nickel coatings can be produced by electro deposition in thicknesses which give complete protection to the underlying material. In these forms it is malleable and ductile, strong and tough and will take a high finish.

Choice of the proper nickel alloy for any given application depends upon the condition it must meet in service. In the chemical industries particularly, protection against corrosion is the chief problem. Broadly speaking, corrosion problems may be divided into certain general groups: Corrosion from contact with acids of the non-oxidizing group—sulfuric, hydrochloric, phosphoric, acetic, tartaric, and others; corrosion from oxidation at high temperatures; corrosion from exposure to ordinary atmospheric conditions, and corrosion from contact with acids in the oxidizing group, such as nitric, sulfurous, ferric, salt mixtures, chromic acid, etc.

In more general terms, the common corrosives may be classified as follows: air, soil, acids, oxidizing agents, natural waters, salts and brines, organic materials and



foods, high temperatures, sulfur compounds, and alkalies.

Nickel resists corrosion to a fairly high degree in six of these groups; air, soil, natural waters, salts and brines, organic materials and foods, and alkalies. Three others—acids, oxidizing agents and high temperatures—are reasonably well resisted by nickel.

It is well to remember that nickel as a corrosion resistant material works hand in hand with two other principal corrosion resisters—chromium and copper. Chromium is particularly notable for its resistance to oxidizing agents; copper for its resistance to acids. Nickel is intermediate in its resistance to both these main types of corroding agents. It is helped in its resistance to oxidizing agents by alloying with chromium and in its resistance to acids by alloying with copper.

In the chemical industries nickel alloys not only protect the equipment against the corrosive action of chemicals, but they also prevent the chemicals themselves from becoming contaminated by contact with the metal. This is especially important in the food processing industries, the products of which are often extremely sensitive to such contamination. While the corrosion resistance of nickel alloys is the factor which determines the life and ability of equipment to perform its work, the physical and mechanical properties of nickel determine how a given piece of machinery can be made.

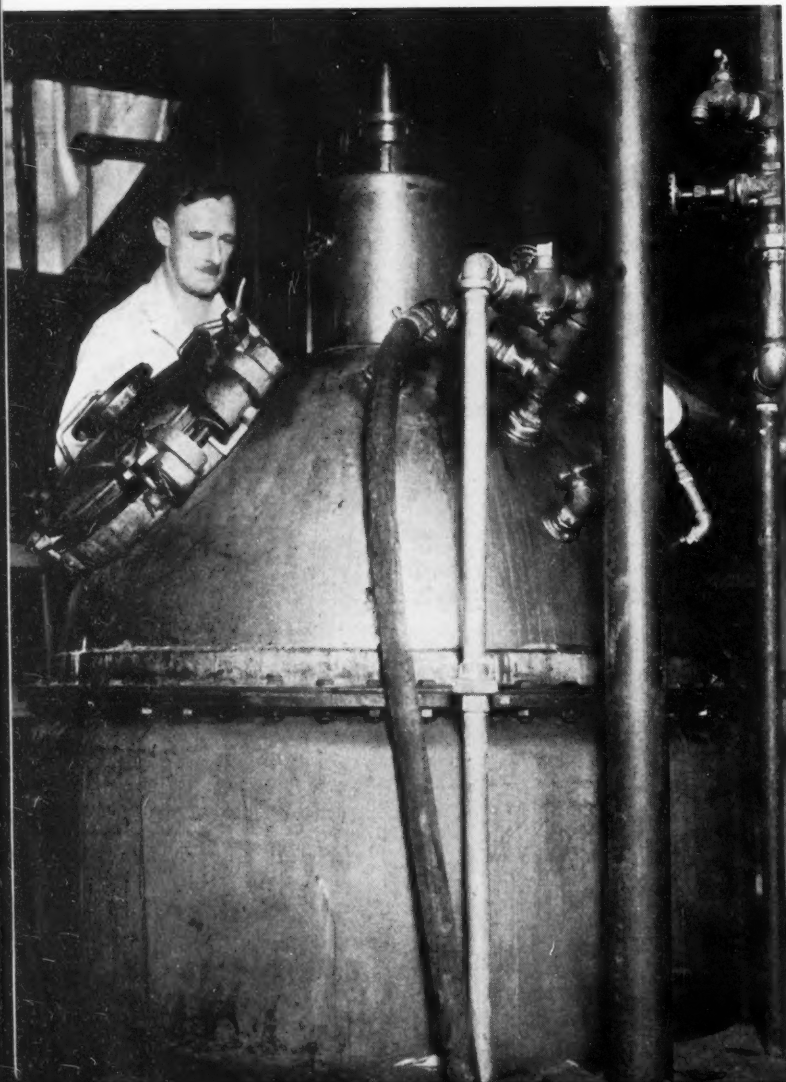
Among the nickel alloys most widely applicable to chemical use on the count of corrosion resistance and machineability, monel stands out. This is a white nickel-copper alloy containing approximately two-thirds nickel and one-third copper. It is the nearest approach to pure nickel in its properties and often gives more satisfactory service in certain applications. Its lower cost commends it to the economical production of equipment. In physical properties, the strength, yield point, and hardness of monel are appreciably greater than for pure nickel; but to high temperature oxidation and other oxidizing agents, monel's resistance is somewhat less.

Within recent years "K" alloy has been developed by the addition of about 3.5 per cent. aluminum to monel. This alloy improves the mechanical properties of monel without substantially changing its corrosion resistance. Its particular advantage lies in the ability to increase its mechanical properties above monel by heat treatment or combination of heat treatment and cold rolling. This aluminum-bearing monel metal also lends itself to rolled shapes and forgings. Another of the newer nickel alloys, called "S Monel," involves the addition of about 3.5 per cent. to 4 per cent. silicon. It can be used for castings of high hardness and strength, and it affords unusual resistance to wear in contact with metal, and freedom from galling and seizure. The addition of silicon to monel seems to improve corrosion resistance except in the case of alkaline attack. Another of the newer nickel alloys is known as "R Monel" which is put to important use in the production of corrosion-resisting screws and bolts, because they can be machined with greater ease than regular monel.

Another important nickel alloy is especially famed for its resistance to tarnish. It is known commercially as "Inconel" and consists of 80 per cent. nickel, 13 per cent. chromium, 7 per cent. iron. Inconel is highly resistant to bleaching agents, photographic solutions, and to direct oxidation at high temperatures. In its mechanical properties this nickel chromium alloy is stronger than pure nickel and has good ductility. Thus it compares physically with the stronger modifications of monel.

There are a number of copper-nickel alloys lower in nickel content than Monel. Among recent developments in this group has been the discovery that copper-nickel alloys containing from 20 per cent. to 30 per cent. nickel are highly resistant to sea water. This has found a place for them in the manufacture of condensers where the cooling medium is salt water. Their easy working quality enables manufacturers to form them into small tubes, and the higher content of the lower priced metal, copper, makes the operation an economical one considering the corrosion resistance factor. Such alloys have also been found valuable in preventing fouling from marine growths.

Stainless steels are coming into increasing use in the chemical industries. In this type of alloy the stainless and non-tarnishing qualities of chromium are availed



Jacketed nickel kettle constructed for use in the manufacture of cast phenolic resin.

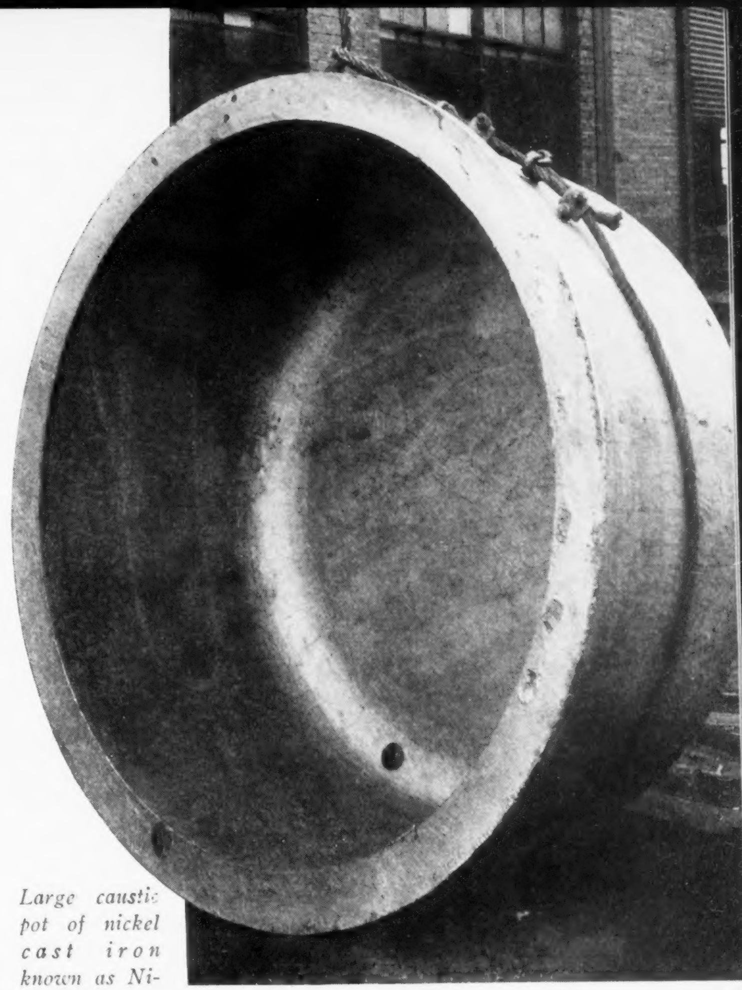
of; while the introduction of nickel makes the metal more workable and ductile and indirectly affects corrosion resistance by preventing the formation of less corrosion-resisting constituents.

Among cast irons alloyed with nickel, many find valuable and useful applications in the manufacture of chemical equipment. One of these is known as Ni-Resist, a cast iron containing approximately 14 per cent. nickel, 6 per cent. copper and 3 per cent. chromium. Alloys of the Ni-Resist type not only are found to be good corrosion resistants but also resist erosion to which pumps and valves are often subject. Their inherent toughness is an improvement on ordinary cast irons, and the chromium content makes for strength and hardness. In the class of Ni-Resist is an extremely hard, white cast iron—Ni-Hard—containing 4 per cent. to 5 per cent. nickel and 1.25 per cent. to 2 per cent. chromium. This alloy is likely to find uses, as yet undeveloped, in oil production equipment.

Heavy equipment for chemical plants, such as caustic evaporators, makes use of nickel-clad steel in which nickel is permanently bonded to steel by hot rolling. Usually the nickel is 10 per cent. of the total thickness. Nickel-clad steel is as strong and malleable as steel and can be easily joined by welding. Inconel-clad steel is also available as a similar product.

It is not unlikely that nickel electroplate will soon find wider applications in the chemical field, due to recent development of methods for applying heavier coats of nickel to properly prepared base metals. The electroplate is perfectly adherent and comparable in soundness to furnaced metal when in the form of thick deposits. It has a range of physical properties wider than rolled metal. It is now possible to increase the weight of nickel plating previously made, and thus completely protect the base metal, at a cost that makes the operation economical.

This brief description of the constituents and qualities of nickel alloys will, it is hoped, give the man who is not a metallurgist, some idea of the wide scope, extreme flexibility and broad usefulness of nickel alloys in the chemical industries. As this industry has developed from early days when glass and ceramic materials were largely used, to a tremendous mass production industry, equipment has had to keep pace with the strides of chemistry. Nickel alloys are playing an important role in guaranteeing pure chemical products, minimizing or altogether eliminating the serious effects of corrosion, successfully dealing with problems of high temperatures and high pressures in their effect on equipment and providing metals with definite physical and mechanical properties that are revolutionizing the whole art of chemical manufacture.



Large caustic pot of nickel cast iron known as Ni-Resist.

Condensed Review of Nickel Alloys in the Chemical Industries

NICKEL STEELS—½% to 6% nickel. For power plant machinery. High strength and toughness. In form of castings used for valves, fittings, valves and pumps.

STAINLESS STEELS—2% to 20% nickel. Resistant to corrosion, stain and tarnish. Used in chemical equipment subject to corrosive action, including food handling apparatus.

HEAT RESISTANT ALLOYS—3% to 85% nickel. Mechanically stable at high temperatures. Resists oxidation. For furnace parts, tubes and retorts in chemical industries.

NICKEL CAST IRONS—½% to 3% nickel. General machinery applications not requiring high corrosion resistant qualities.

COPPER-NICKEL ALLOYS—15% to 30% nickel. For pipe lines, valves and corrosion resisting castings. Well suited to salt water service. Anti-fouling.

NICKEL AND NICKEL SALTS—For catalysts in gas purification. Also in production of edible oils, soaps and various organic chemicals and for electroplating.

MALLEABLE NICKEL—Over 99% nickel. Freedom from undesirable metal contamination makes its use important in viscose, rayon and soap industries; for production of caustic soda, transportation and storage of phenol and for vessels containing photographic chemicals, gelatines and other organic products. Highly important to protect foods from color and flavor changes due to metal contamination.

NICKEL CLAD STEEL—Used in plates and sheets for economical fabrication of heavy chemical equipment.

MONEL METAL—70% nickel. 30% copper. Has broad use in chemical industries for kettles, stills, condensers, heat exchangers, evaporators and all kinds of processing equipment. Combines excellent mechanical properties with high corrosion resistance and freedom from contamination.

INCONEL—80% nickel. 13% chromium. Widely applicable to chemical equipment on account of resistance to corrosion and tarnishing by food-stuffs and to effects of high temperatures. Important where fatty acids, coal tar products and alkaline sulfur compounds are used.

"S" MONEL—Containing silicon. For castings subject to unusual wear.

NI-RESIST—14% nickel, 6% copper, 2% chromium; or 20% nickel, 2% chromium. A relatively new alloy used in cast irons. Non-magnetic. Resists corrosion and moderately high temperatures. Applicable to equipment in chemical, paper, textile and food industries.

NICKEL ELECTROPLATE—Can now be produced in any reasonable thickness and with excellent strength, ductility and corrosion resistance.

NI-HARD—4% to 5% nickel with 1.5% to 2.0% chromium. An alloyed cast iron having exceptional resistance to abrasion.

"K" ALLOY—Containing aluminum. Can be strengthened by heat treatment and is non-magnetic.

LOW EXPANSION CORROSION RESISTANT CAST IRON—28% to 32% nickel, 3% to 4% chromium; or 34% to 38% nickel, 3% to 4% chromium. Used for corrosion resistant applications and also where low co-efficient of thermal expansion is necessary.

Methylol Ureas

Some New Uses by H. Peters

INFORMATION available on the mono- and di-methylol ureas is at present scanty, yet considerable possibilities lie in these compounds. In the dyeing and finishing of textiles they have already been found useful, in addition to their interesting value in the manufacture of new resins and plastics.

In the reaction between urea and formaldehyde Goldschmidt obtained by condensation in neutral or acid solution a white granular substance which indicated the formula $C_5H_{10}N_4O_3$ on analysis. Einhorn prepared two crystalline compounds formed by the interaction of urea and formaldehyde to which he ascribed the following formulas:

Urea	Mono-methylol-urea	Di-methylol-urea
H_2N—C(=O)—NH_2	HO.CH_2.NH—C(=O)—NH_2	HO.CH_2.NH—C(=O)—NH.CH_2OH

```
H2N        HO.CH2.NH          HO.CH2.NH
   \                \                  \
    C=O              C=O                C=O
   /                /                  /
H2N              H2N          HO.CH2NH
Urea      Mono-methylol-urea  Di-methylol-urea
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Whether it is scientifically legitimate to suggest that the product of interacting urea and formaldehyde is capable of representation by a formula is dubious for probably many side-reactions take place at the same time. The above must be accepted as an inspired guess and even as such is not without interest.

The following method of preparing dimethylol-urea is proposed by the I. G., whose directions make clear the general procedure to be adopted. By this process, a yield of 115 kgm. of dimethylol-urea is obtained from 60 kgm. of urea, the product having a melting point of 128 to 130° C. 200 kgm. of 30% aqueous formaldehyde solution is made alkaline by 200 c.c.s of aqueous 5 normal caustic soda (roughly 20%), and warmed to 30° C. The urea (60 kgm.) is now added with stirring. Some heat is evolved which initiates the reactions and makes the application of heat unnecessary. The mixture is distilled at 45° C. under the reduced pressure of 30 mm. of mercury during some 30 minutes, when about 48 liters of water should be removed. It may be necessary to apply gentle heat in the distillation, but towards the end of the process, the mixture may be permitted to cool to 30° and the pressure to fall to 20 mm. The concentrated liquor should now be allowed to stand for 10 to 12 hours and cool to 15°. Dimethylol-urea then separates as a stiff crystalline pulp and subsequently may be dried at a temperature of 35 to 40° under a pressure of 40 mm.

Imperial Chemical Industries, Ltd. have prepared wetting, cleansing and softening agents for textiles from this substance. First it is condensed with some 10 molecular proportions of ethylene oxide when a long poly ethoxy chain of atoms is attached:—O.CH_2.CH_2.O.CH_2.CH_2.O.CH_2.CH_2OH—after which, the resulting substance (or more probably, mixture of substances) is esterified by fatty acids or their chlorides. Not improbably the ethylene oxide links on the primary alcohol methylol group and that fatty acid attaches itself to the imine nitrogen. The same products are stated to be useful as retarding and levelling agents in dyeing with vat colors, and to improve the fastness of the resulting dyeings.

Ciba have discovered a very interesting and technically useful property of dimethylol-urea in its power to change the affinity of cotton and cellulosic fibers and render them sensitive to acid dyes. Normally these dyes are used almost exclusively on wool and silk, and their adaptation to cotton would appear to open up new worlds for the dyer and textile colorist. Here is how cotton may be given that new affinity:

30 gm. of dry dimethylol-urea is dissolved in 150 c.c.s. of water and the total volume of the solution made up to 200 c.c.s. By the addition of acetic acid, the pH is adjusted to 4.5, the liquor is then ready for the cotton fabric. 30 gm. of such material is immersed at room temperature for 5 to 10 minutes, squeezed until it retains only its own weight of liquor and then dried in air.

The treated fabric may now be printed in the usual way with a starch-thickened paste containing preferably 5% ethylene diamine. The dye specified for use is obtained by methylating a mixture of the alkali salts of para-diamino-anthrarufin-2-sulfonic acid, and it is used in conjunction with formic acid. Portions of the fabric not protected by paste acquire a deep blue color while the pasted regions are light blue. To fix the resinous substance to the cloth, that is to polymerize the dimethylol-urea, a short period of heating is required, such as for example 2 minutes hot ironing. In the above process, the heat-treatment is given after the application of the print paste.

Since dimethylol-urea endows textile fibers with new affinities, it is not surprising that it also tends to increase the fastness of dyeings if applied after the dyeing. Here then is a new technique of after-treatment which improves the fastness to washing and soap of colors otherwise having poor fastness. The process of dyeing is as usual. Cotton is immersed in a boiling bath of dye containing salt. It is rinsed, dried and immersed at room temperature in a 15% aqueous solution of dimethylol-urea, pressed until it retains only its own weight of liquor, then dried and finally heated at 165° C. for a period of 2 minutes. This increased fastness may be attributed rather to a physical than to a chemical cause. The resin formed after the dye is applied becomes more firmly attached and insoluble on heating, making the dye also substantially permanently fixed to the fiber.

The application of 10 to 15% dimethylol-urea on the weight of fiber endows cotton with resistance to creasing, a discovery by Tootal Broadhurst and Lee in their celebrated anti-crease processes.

Reference has been made to E.P. 368,027, 420,137, 433,210, 429,209.

Will It Pay?

Economic Research Applied to a Project or a Product

By Harold A. Levey

HOW to survey the practicality and money-making possibilities of an enterprise? Today this has become a leading question. If the project is old and established the investigation is relatively simple. If, however, the enterprise is a new one either as to time or the nature of the operations conducted, or the product manufactured, then the study becomes a rather extended undertaking.

For an old business the task consists of examining the books by auditors or accountants with a report containing in addition to the assets and liabilities, many details on their investments in plant, site, and structure, productive and non-productive equipment, raw materials, orders on hand, merchandise in process of manufacture and finished goods for delivery and in storage, the condition of all their active accounts. While there are several other lesser or special aspects of their work, it substantially ends here.

The investigation should then be made by consulting engineers who survey the plant and the production operations. The value of the plant location—not merely as real estate but also as compared with that of its competitors—must be considered. Its proximity to its major consuming market, the probable permanence of those markets; the location of sources of supply of the raw materials with reference to the plant, are all matters of importance. The matter of obsolescence should then be investigated. This applies to plant structure and layout as well as to types of equipment. The physical condition of the structure and equipment, largely from the standpoint of its remaining period of useful life without abnormal maintenance expense, is then estimated.

In studying processing operations it is preferred practice to lay out a "Flow Sheet" indicating the sequence of all operations involved. Such a layout for many chemical manufactures is outlined in Fig. I. No matter what the steps of the processing may be a layout of this kind invariably clarifies the manufacturing problems involved.

While it may be possible to calculate the cost of manufacturing a given product from the accountant's audit, it is far preferable in surveying a project to compute the production costs on a unit basis. These values may be determined by the following modifications of a general cost sheet as outlined in Fig. II.

Fig. I

WORKING FLOW SHEET

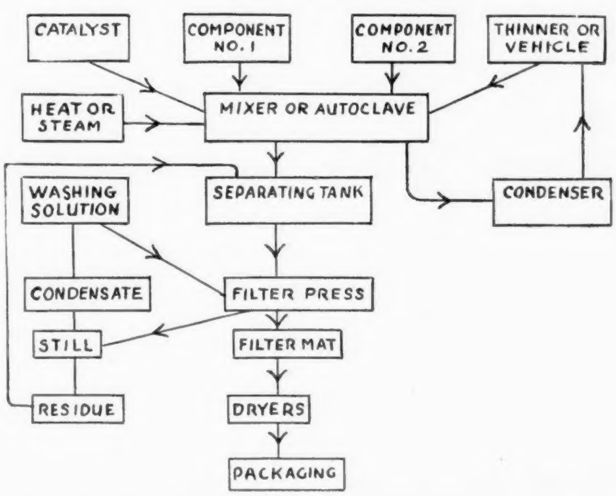


Fig. II

PROSPECTUS COST SHEET

Name of Enterprise or Product

INVESTMENT REQUIRED

Plant equipment	$
Plant buildings and site	$
Total	$
Annual depreciation rate at ——%	$
Annual taxes and insurance rate at ——%	$

RAW MATERIALS REQUIRED

Name of material	Quantity used per month	Unit cost in stock	Total cost	Cost per lb. of product
Component No. 1	......lbs.	...¢ per lb.	$......	...¢ per lb.
Component No. 2	......lbs.	...¢ per lb.	$......	...¢ per lb.
Total material cost			$......	...¢ per lb.

Capacity per month ....lbs.
Capacity per year ....lbs.

EQUIPMENT REQUIRED FOR MANUFACTURED PRODUCTS

Number of Units required	Name of Unit	Cost
....	Mixers	$..........
....	Autoclaves	$..........
....	Separating tanks	$..........
....	Filter presses	$..........
....	Dryers	$..........
....	Stills	$..........
	Total	$..........

CONVERSION COSTS

	Per Month	Per Pound of Product
Supervision	$..........	........¢
Labor (operating)	$..........	........¢
Maintenance labor	$..........	........¢
Maintenance materials	$..........	........¢
Steam	$..........	........¢
Power	$..........	........¢
Water	$..........	........¢
Air	$..........	........¢
Gas	$..........	........¢
Supplies	$..........	........¢
Laboratory	$..........	........¢
Direct Conversion	$..........	........¢
General plant costs	$..........	........¢
Insurance and taxes	$..........	........¢
Depreciation	$..........	........¢
Development	$..........	........¢
Indirect Conversion	$..........	........¢
Packing	$..........	........¢
Shipping	$..........	........¢

Summary of Costs

	Per Month	Per Pound of Product
Materials	$..........	........¢
Direct conversion	$..........	........¢
Indirect conversion	$..........	........¢
Packing	$..........	........¢
Shipping	$..........	........¢
Total cost F. O. B. cars ..	$..........	........¢

SALE OF PRODUCTS

	Quantity Per Month	Price per Pound	Total
Product No. 1	........lbs.	......¢	$..........
Product No. 2	........lbs.	......¢	$..........
Total	........lbs.		$..........
Gross sales per month			$..........
Less total costs per month			$..........
Gross margin			$..........
Administration and sales at ——% of gross (per month)			$..........
Monthly net profit			$..........
Per cent. profit on sales			........%
Annual net profit			$..........
Annual profit on investment in per cent.			........%

If by-products are obtained, these should be treated on a separate sheet containing the data covering their costs and profit yields, which values may then be used to modify the values in the tabulation of Summary of Costs. Products recovered for re-use may be deducted from the quantity of initial materials required in the various operations. Throughout this table is obviously suggestive of the method employed rather than a definite form to be followed blindly. If the enterprise involves the manufacture of a number of products, then this computation should be carried out separately for each product.

If the business is well established, consumer acceptance of the product can be readily determined. The grade, quality, purity, or form should be investigated and compared with competitors' merchandise. Having available the annual pounds and dollars output, it would be well to determine what percentage this is of the total national production, extent of the equivalent product imported, the tariff same carries, the probabilities of its change and the like. The number of domestic producers, their approximate output and geographical location, is also valuable contributory data. At the same time similar competitive products and substitutes should be investigated. A study of the annual price change, as well as the price fluctuations over a complete and recent economic business cycle should be made.

If the project or product is new, then in addition to the above surveys which can be practically made, it will be necessary to make a number of others. It is assumed that the development has passed the laboratory and is in the pilot plant or semi-commercial period of its evolution. This stage will have to have been attained in order to obtain yields, preliminary production costs, type of equipment required, cost of equipment necessary, plant layout, and the type and extent of labor and supervision for the production cycle. At least a preliminary examination of the literature on the subject should be made in order to properly and intelligently evaluate the development. At the same time, and to properly supplement the above, a patent search should be made. This search will give a history and state of the art. At the same time the attorney who makes the search will be in a fair position to advise whether or not your operations or products infringe patents already issued. If the development is covered in the whole or in part by patents resulting from the development, then the attorney can readily appraise these patents in the light of the prior art.

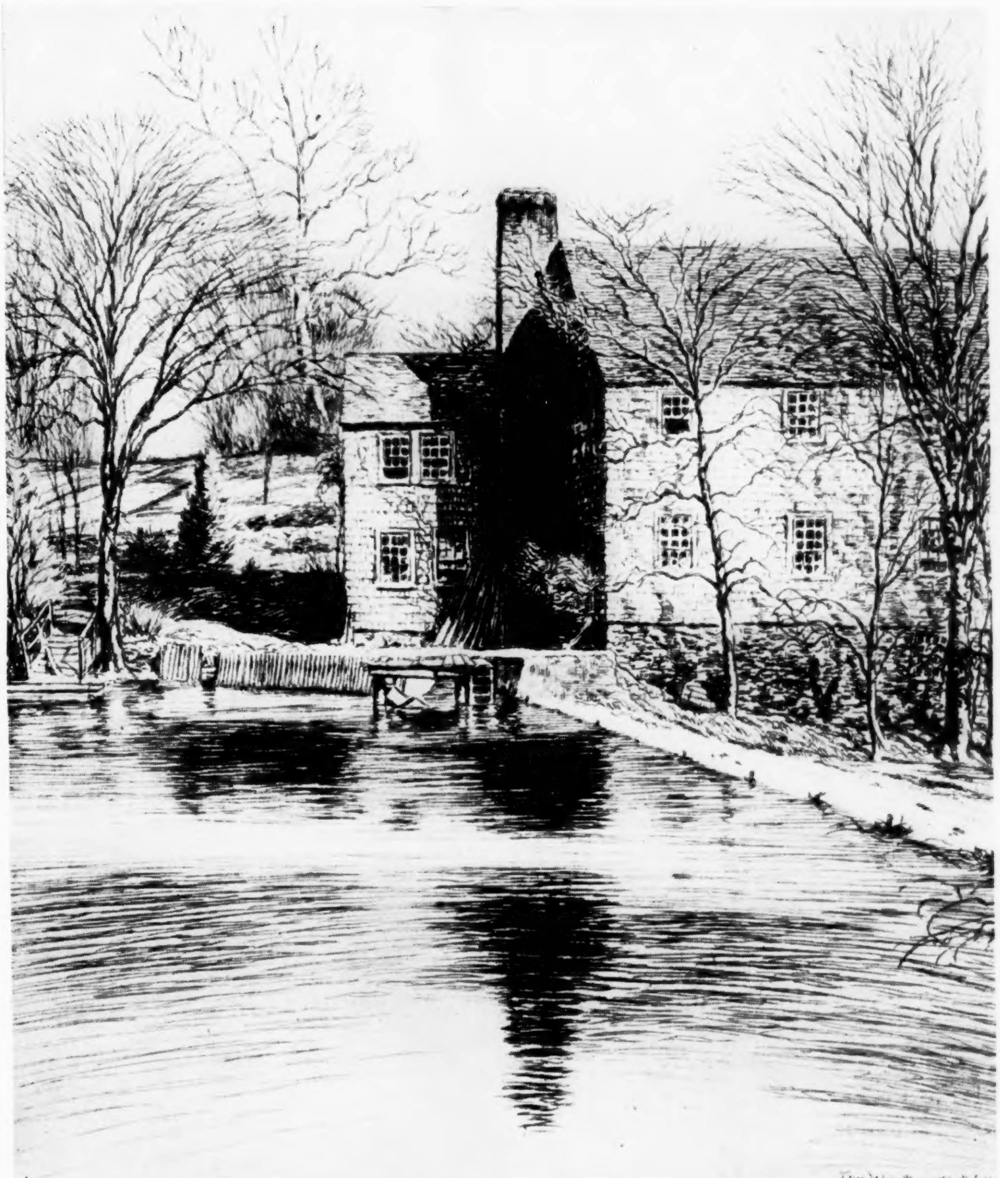
With a semi-commercial plant in operation, adequate working samples can be placed in the hands of the prospective consumers that they may determine its utility for their purposes. Its shelf life and possible type of changes which take place when subjected to a variety of conditions can be noted. Much can be learned by investigating both the requirements of competitive materials as well as substitutional products.

The cost of a report of this type varies with the industry involved and its magnitude, the detail needed and the effort required to procure the necessary information. However, whatever the cost it is unquestionably a wise investment. The information so obtained will be of substantial value as a guidebook, both for operating and merchandising programs and policies.

Fuller's Earth Industry in 1937

Domestic production of Fuller's earth in '36, as reported by the Bureau of Mines, was 230,814 tons valued at $2,264,978 compared with 227,745 tons valued at $2,230,229 in '35. Apparent consumption increased only two per cent., whereas petroleum refining jumped 10 per cent. More significant still, oil refiners made an all-time record last year, far ahead of their '29 mark, whereas the quantity of Fuller's earth used was 26 per cent. less in '36 than in '29 and 31 per cent. less than in '30 when it reached its maximum of 328,642 tons.

Plant Operation and Administration



The Old Mill at Westport, Conn., now rebuilt in stone as a research laboratory, where The Dorr Company held a housewarming on July 30.

A Digest of New Methods and Equipment for Chemical Makers

New Tests and Standards

Abstract of the Chemical High Points of the 40th Meeting, A.S.T.M.

THE 40th annual meeting of the American Society for Testing Materials, New York, June 28-July 2, registered an attendance of 1525, an all-time high. Particularly significant is the fact that 52 proposed specifications and tests were accepted as tentative. This figure, exceeding that of any other year, indicates the intensive work of the various Society committees which developed the new tentative standards. Following is a summary of papers of outstanding chemical interest.

Symposium on Consistency

E. C. Bingham, Lafayette College, chairman A.S.T.M. Technical Committee on Consistency, Plasticity, etc., outlined recent progress in consistency measurement pointing to realization of need for a practical standard of viscosity. He outlined errors in viscosity due to lack of attention to correction factors. He mentioned that the resolutions of the World Petroleum Congress in London marked an important step in our progress, but that these placed the responsibility upon each nation for obtaining results which are readily usable or convertible for use of all. These resolutions in part indicated that viscosity should be expressed in C.G.S. units and should be expressed as kinematic viscosities, but that specific gravities should be reported in addition.

M. Mooney, U. S. Rubber Products, analyzed A.S.T.M. consistency and plasticity tests, and several papers discussing consistency measurements in various industries such as paint, asphalt, coal-tar, rubber and rubber products, and petroleum and petroleum products.

J. C. Geniesse, Atlantic Refining Co., stated that the adoption of kinematic or absolute viscosity units in place of Saybolt would simplify viscometry. The units would be intelligible to layman and engineer and would provide a universal scale applicable to petroleum, paint, tar, cement and other plastic or liquid products.

Symposium on Tests of Coal

Frisch and Foster, Foster Wheeler Corp., discussed "Pulverizer Performance as Affected by Grindability and Other Factors," and concluded that the relative ranking of a coal depends on the method used. The two tentative Methods of Test for Grindability of Coal by the Ball-Mill Method (D 408-35 T) and for Grindability of Coal by the Hardgrove Machine Method (D 409-35 T) assign quite different relative ratings to the same coal. But these ratings may be correlated in view of the permissible accuracy with which tests may be checked and reproduced by these methods. They pointed out that pulverizers of different sizes, though of the same type, do not rank coals alike and that laboratory grindability ratings are useful, and may be used to predict the performance of a pulverizer on a coal of known grindability without test, but only provided the grindability capacity relationship for the pulverizer has been previously determined by test, and effects of such other factors as feed size, moisture, and fineness, tending to mask the effect of grindability properly taken into consideration.

A. W. Gauger, Pennsylvania State College, believes the importance of ash fusibility as measured by the standard A.S.T.M. ash softening temperature test has been over-emphasized. Had there been no coal with highly refractory ash, the problems incident to ash disposal (including clinkering, etc.) would have been solved by equipment design and firing practice. Since the reserves of coal with highly refractory ash are not large, these problems will ultimately have to be solved in that manner. Present ash softening temperature method is only a qualitative index of the probable severity of clinker formation; consequently, a search will continue for methods which promise better indices. Several such interesting developments are under way.

O. O. Malleis, Appalachian Coals, pointed out that no standard methods of determining the relative caking, plastic, gas- and coke-making properties of bituminous coal with particular reference to the manufacture of coke exist but this does not indicate the lack of interest in or of value of the information. He outlined various tests on coke properties, plastic properties and gas and coke caking properties.

Two new tentative standards were approved for publication as tentative covering the Method of Drop Shatter Test for Coal and the Method of Tumbler Test for Coal. The shatter test is suitable for testing both a standard size of different coals and for testing different sizes of the same coal and the tumbler test method is intended for determining the relative friability of a particular size of lump coal.

Bituminous and Road Materials

Hillman and Barnett, Shell Development Co., gave chemical evidence supporting the conclusion drawn from the rheological properties of cracked asphalts, that their greater degree of dispersion as compared with straight-run asphalt can be accounted for by the greater aromaticity of the maltenes. It was further shown that the components in low-level cracked asphalt have in all probability average molecular weights lower than that of the corresponding components in a straight-run residue. The chemical structure of asphaltenes was discussed, together with the probability that they consist of a combination of units consisting of cyclic groups of probably no more than two or three rings condensed together.

R. N. Traxler, The Barber Co., and C. E. Coombs, formerly with The Barber Co., now with du Pont, pointed out that the increase in consistency of asphalts with time indicates the development of internal structure. This structure is developed more rapidly in air-blown than in steam- or vacuum-refined bitumens; it is partially or wholly eliminated by heating or mechanical working. In asphalt-mineral mixtures age-hardening appears to be chiefly dependent on the nature of the bitumen present. The higher the rate at which internal structure develops, the more marked the deviation from viscous flow.

Asphalts with high rates of age-hardening and definite deviations from viscous flow give characteristic microscopic patterns when the surfaces are etched with ethyl ether or 86° Baumé naphtha. Essentially viscous asphalts have low rates of age hardening and show no surface patterns. Explanation offered for increase of consistency with time is a gradual isothermal sol-gel transformation, the magnitude of which depends on the sources and method of processing.

Committee D-8 summarized recommendations resulting from intensive work during the year. Two methods of test for sieve analysis of granular and non-granular mineral surfacing for asphalt roofing and shingles were approved as new tentative standards. The committee studied in detail specifications for asphalt for use in damp-proofing and waterproofing above and below ground level and recommended a new consolidated tentative specification replacing the two former ones. The new specification for coal-tar pitch for roofing, damp-proofing and waterproofing conforms to present practice in eliminating differential requirements for type and use and replaces six former tentative specifications.

McCrone and Field, U. S. Division Engineer Office, and The Asphalt Institute, respectively, described progress in asphalt mixtures for mass construction above and below the water line with especial reference to jetty work. Underwater construction

presupposes conditions completely dissimilar to pavement work and the paper shows the purpose of the structures for which asphalt mixtures for underwater placement have been devised. They should be mixed and placed at relatively high temperatures (450° F.) but the completed structure probably will meet a narrow range of temperature, probably 32° F. to 80° F. Impact as in pavement design is not a factor. Mixing, handling, placing, and compacting asphalt mixtures in great masses under conditions met with in underwater construction involve new methods and equipment not yet fully developed.

Committee D-4 on Road and Paving Materials submitted new tentative specifications for standard sizes of coarse aggregates for highway construction which replace two existing specifications. The new tentative specifications cover standard size designations and maximum permissible ranges in mechanical analyses for standard sizes of coarse aggregates and screenings for use in the construction of highways.

R. R. Thurston, The Texas Co., described the separation into asphaltenes, resins and oils of 200° F. melting point asphalts prepared from Mexican, Gulf Coast, and Mid Continent crude. Synthetic asphalts were prepared by recombining these constituents in various proportions and from different sources. Accelerated weathering data were obtained on these materials. Results indicate increased resistance to weathering when increased proportions of resins were used. The authors indicated that good weathering is dependent not only upon the character and source of the resins and oils but also upon the quality of the asphaltenes. These constituents from different asphalts vary widely in their characteristics.

Petroleum Products

Committee D-2, on Petroleum Products and Lubricants recommended four test methods for publication as tentative. These cover Kinematic Viscosity, Conversion of Kinematic Viscosity to Saybolt Universal Viscosity, Distillation of Plant Spray Oils, and test for Vapor Pressure of Petroleum Products (Reid Method). This latter new standard is a consolidation and revision of the former test for vapor pressure of natural gasoline (D 323) and motor aviation gasoline (D 417). In addition to these new tentative standards certain revisions were incorporated in the Test for Knock Characteristics of Motor Fuels (D 357-36 T) and the Standard Test for Melting Point of Paraffin Wax; also improvements in the procedure for free alkali or free acid in the standard methods of analysis of grease.

Two proposed methods submitted for publication as information covered, respectively, a test for dropping point of lubricating greases and test for unsulfonated residue of plant spray oils.

Subcommittee on corrosion test for lubricating oils reported progress in its work referring to the paper which had been presented during the year on the relation of oil tests to bearing metal corrosion. Subcommittee V on Viscosity has been very active and Committee D-2 approved its recommendations covering several new and revised viscosity-temperature charts; also a proposal to publish Kinematic-Saybolt conversion tables and take immediate action on proposed revisions of the Method of Test for Viscosity by Means of the Saybolt Viscosimeter (D 88-36) to take care of certain difficulties encountered with cut-back asphalts.

The new subcommittee on aniline point met for the first time and outlined a tentative program of work. The Section on Domestic and Industrial Fuel Oil considered proposals to change the specifications for fuel oils, but no action was taken in the absence of supporting evidence. The Section on Diesel Fuel Oils took no action on proposed changes in ash content, carbon residue, cetane number in Diesel fuels, but did vote to recommend that all Diesel fuels except 6-D should be free from inorganic acidity or alkalinity.

Water

T. H. Daugherty, Hall Laboratories, pointed to need for determining extremely small concentrations of dissolved oxygen in plant waters, particularly those pertaining to boiler plants. The various modifications of the basic Winkler procedure are considered from the standpoints of sensitivity, accuracy and practicability in the plant. The Schwartz and Gurney double titration B modification, with several recommended changes in procedure is believed to be the simplest to operate with a sensitivity and accuracy equal to other methods and hence most satisfactory. Emphasis was placed throughout upon the careful technique that is essential in the determination of traces of dissolved oxygen. The author made recommendations for comparative tests of all methods, for further investigation of the electrometric titration and for determining the permissible limit in the sample of contaminants such as nitrite and sulfite.

J. A. Tajc, Duquesne Light Co., indicated that corrosion in stressed mild steel at elevated temperatures by solutions of sodium hydroxide and silica is not wholly electrochemical, but that colloidal phenomena are involved. He showed by thermodynamic calculations that the spontaneity of the corroding reactions of iron in water is not affected by the hydroxyl ion concentration and that the observed increase in rate of corrosion with sodium hydroxide concentration is probably due to peptization. It is believed that silica precipitates the peptized iron oxide to protect the ferrite grains while permitting corrosion along highly stressed and probably cracked grain boundaries.

Sheen and Noll, W. H. and L. D. Betz, pointed out that hardness in water may be determined by a direct titration with the potassium salt of certain fatty acids. Potassium stearate and potassium palmitate are found to be of value, the palmitate allowing the more accurate determination in the presence of interfering ions. Comparisons with the standard soap method on a number of samples showed the palmitate method to be subject to less error. The more extensive use of the palmitate method was suggested.

Non-Ferrous Metals

Committee B-2 on Non-Ferrous Metals and Alloys submitted new tentative specifications for rolled zinc which are in effect revisions of the previous standard (B 69), which they supersede. The adoption of revision of Standard Specifications for Slab Zinc (Spelter) (B 6-33) was approved for reference to Society letter ballot. The major change provides for zinc of extreme purity as grade (1a) and the specifications were brought into conformity with present-day practice.

Committee B-5 on Copper and Copper Alloys, Cast and Wrought, developed new Tentative Specifications for Copper and Copper-Alloy Seamless Condenser Tubes and Ferrule Stock, which were approved. The specifications combine in a single standard the detailed specification requirements for the various alloys manufactured in the form of seamless tubes for use in surface condensers, evaporators and heat exchangers, including admiralty metal, Muntz metal, and copper-nickel alloy. The existing standard and tentative specifications covering these alloys were therefore withdrawn.

Committee B-6 on Die-Cast Metals and Alloys presented revisions of the Tentative Specifications for Aluminum-Base Alloy Die Castings (B 85-33 T), including the replacement of Alloy No. VIII by Alloy No. XI and the addition to the table in the appendix to the specifications of test values showing the physical properties for Alloys Nos. XI and XII that may be expected of tension and impact specimens when made in a die.

Appended to Report of Committee B-7, Light Metals and Alloys, Cast and Wrought, was a discussion on Methods of Testing Oxide Coatings on Aluminum, giving data and information developed by a special subgroup. The report deals with a part of the methods available for measuring the properties of thickness, abrasion resistance, and electrical breakdown voltage of oxide coatings on aluminum and, of course, further experience with the methods presented will be necessary before standardized conditions of operation can be established and the accuracy of the methods adequately appraised. Other methods, particularly for control purposes, are demanded by industry and

will have to be developed. This report, therefore, should be considered as a progress report in this rapidly developing field.

Coatings

Symposium on Correlation Between Accelerated Laboratory Tests and Service Tests on Protective and Decorative Coatings consisted of discussions under three main topics—Finishes for Indoor Service; Paints for Exterior Service on Wood; and Paints for Iron and Steel. W. R. Fuller, Devoe & Raynolds, was leader of the first topic, H. A. Gardner, National Paint, Varnish and Lacquer Ass'n, of the second, and C. F. Rasseiler, Philadelphia Laboratory, du Pont Co., was the leader of the third topic. The main purpose was to clarify what is known about correlation between accelerated and service tests. A large number of technologists gave case histories and data.

Committee D-1 in presenting its report submitted four new tentative standards comprising specifications for zinc-sulfide magnesium pigment and for titanium-magnesium pigment, methods of routine analysis of zinc yellow pigment (zinc chromate yellow) and method of test for spectral apparent reflectivity of paints. In addition a number of revisions of standards were approved as tentative. The committee recommended four new tentative standards as follows: a test for reactivity of paint liquids, specifications for c.p. zinc yellow (zinc chromate), specifications for para red tone, and specifications for reduced para red.

Masonry Materials and Refractories

J. W. McBurney and D. E. Parsons, Bureau of Standards, described "The Wick Test for Efflorescence of Building Brick" consisting of standing a whole brick on end in 0.5 in. of distilled water, maintained at approximately a constant level. The brick, except that portion in contact with water, is exposed to the air of the laboratory at ordinary temperature. At the end of 5 days the brick is dried in an oven at 105° to 110° C for at least 18 hr. and the amount of efflorescence is estimated by visual comparison with an untreated specimen. The amount of efflorescence is rated on a scale consisting of six classifications or grades. Authors concluded that 5-day wick test correlates well with the grading on exposed panels when the efflorescence on individual bricks rated in excess of "moderate" on the scale used for grading intensity of visible efflorescence.

Committee C-8, Refractories, submitted three proposed tentative standards one of which—Definitions of Terms Relating to Alumina-Diaspore Refractories—was referred back to the committee for further consideration. The others, Methods of Test for Cold Crushing Strength and Modulus of Rupture of Refractory Brick and Shapes, and Methods of Chemical Analysis of Refractory Materials were approved for publication as tentative.

Production Ethyl Chloride

Since the petroleum-cracking, coal-hydrogenation and general carbonization industries now offer more ample supplies of ethylene and other olefines, the possibility of utilizing the olefines in place of the alcohols for the manufacture of the alkyl chlorides is attracting increasing attention.

Various methods for reacting olefines with hydrogen chloride have been proposed, but because of various disadvantages they are all understood to be more expensive than methods using the alcohols. These proposed methods comprise, chiefly, reaction in the vapor phase in the presence of catalysts. It has also been proposed to produce ethyl chloride by reacting ethylene and hydrogen chloride in the presence of a catalyst and a liquid medium in which the primary materials are soluble, but in which they are chemically inert. It has further been proposed to prepare chlorides of near homologues of ethylene (but not of ethylene itself) by reacting hydrochloric acid with gases containing ethylene and its homologues in the presence of iron chloride which might be dissolved or suspended in a non-hydrolyzing liquid.

According to a new process, for which du Pont has acquired patent protection (E.P. 466,134 of 1936), a catalyst is suspended in a suitable liquid reaction medium and hydrogen chloride and an olefine are passed into the suspension, while maintaining the temperature of the reaction medium at a point above the boiling-point of the alkyl chloride produced. Operation may be carried out at atmospheric pressure, pressures below atmospheric or at pressures above atmospheric, provided the temperature and pressure conditions are those at which the alkyl chloride produced exists in the gaseous state. Hence, when the solvent becomes saturated with the alkyl chloride, the latter continuously escapes from the reaction mixture as vapor, substantially as fast as it is formed.

In producing ethyl chloride, according to this invention, a suspension of a suitable catalyst, for example finely divided anhydrous aluminum chloride, is made in a suitable reaction solvent, for example, a chlorinated hydrocarbon having a boiling-point higher than that of ethyl chloride, and into this suspension is passed a gaseous mixture of ethylene and hydrogen chloride. The operation is preferably carried out under a pressure of about one atmosphere while the temperature is maintained preferably at 20° to 60° C. The reaction temperature is preferably sufficiently low to avoid substantial evaporation of the solvent, but sufficiently high to boil off the ethyl chloride as it is formed. As the reaction proceeds some heat is evolved, and it is usually necessary to cool the reaction vessel. Catalyst is maintained in suspension by stirring the reaction mixture.

It is preferred to use an excess of hydrogen chloride, since it has been found that this contributes to lengthening the active life of the catalyst. To obtain the best results, the catalyst and the reactants should be substantially anhydrous, but otherwise the reactants need not be especially purified.

The catalysts found suitable are aluminum chloride, ferric chloride, zirconium chloride and antimony pentachloride. The best yields of ethyl chloride have been obtained by reacting ethylene with hydrogen chloride in the presence of aluminum chloride as catalyst. Aluminum chloride is not as well suited for the reaction between propylene and hydrogen chloride as are some of the other catalysts, for example, ferric chloride.

It is preferred to keep the temperature of the reaction sufficiently below the boiling-point of the solvent to prevent solvent loss by vaporization. The solvents employed should be substantially inert to the catalyst, the reactants, and the product of the reaction. Examples of solvents suitable are chlorinated hydrocarbons which are liquids at temperatures of 20° C. or higher at atmospheric pressure. The highest yield of product generally is obtained when using a chlorohydrocarbon as solvent. It is preferred to carry out the reaction at a pressure of about one atmosphere.

According to one of the examples in the specifications, ethyl chloride was prepared by reacting ethylene with hydrogen chloride in the presence of anhydrous aluminum chloride suspended in β-trichlorethane. The anhydrous aluminum chloride was finely ground and added to about ten times its weight of β-trichlorethane in a closed reaction vessel equipped with an agitator. Anhydrous ethylene was mixed with an excess of anhydrous hydrogen chloride and the gaseous mixture was passed into the aluminum chloride suspension, while the liquid was continuously stirred. The temperature within the reaction vessel was maintained at 42-60° C. by water cooling; the pressure was approximately 1 atmosphere. The vapors of ethyl chloride leaving the reactor were scrubbed with caustic alkali to remove acid and condensed under 1 atmosphere pressure by cooling with solid carbon dioxide. In a series of 5 runs, a product consisting of 95 to 98 per cent. ethyl chloride was obtained in yields of 91 to 100 per cent., based on the ethylene used. —*Chemical Trade Journal*, July 9, '37, p. 23.

Potassium Permanganate
Electrochemical Manufacture

Electrochemical manufacture of potassium permanganate is discussed by R. Desmet in *L'Industrie Chimique Belge,* May, 1937. The potassium manganate may itself be produced either by purely chemical methods or by electrochemical methods. The former process is usually operated as follows.

A mixture of equal parts of finely ground manganese dioxide and caustic potash lye is heated until a hard mass is formed. This is then subjected to grinding at a temperature of 500° C. until a test sample shows a content of 70 per cent. by weight of potassium manganate. The grinding is effected in the presence of a current of air. After cooling, the mass is dissolved in a potash solution with the object of obtaining a solution containing 85 grammes of manganate and 50 grammes of potash per litre. This solution is, after filtration, ready for the electrolysis to permanganate. This chemical method has been modified, particularly by the Usines du Rhône by the method described in French Patent 648,968, according to which oxygen or air is blown into a potash bath containing manganese dioxide in suspension. The conditions of transformation depend on the concentration of the potash, and general experience is that the yield is highest when the potash has a concentration between 70 and 80 per cent. The working temperature of the bath lies between 160 and 200° C. Blowing oxygen into the mass gives better results than blowing air.

Two conditions have to be satisfied in a practicable method for the manufacture of potassium manganate by the electrolytic route. The oxygen produced electrolytically must be brought into as intimate a contact as possible with the material to be oxidized, while the manganate formed must be protected from the reducing action of the cathode. Two methods bring about these conditions: first, insertion of a diaphragm between the anode and cathode, and, secondly, employment of a high density cathodic current. The latter is the more practicable method, and is translated into practice by the employment as cathode of a simple iron point immersed in the electrolyte to the extent of a few m. m. only. The size of the anode surface is so determined that as little as possible of the oxygen evolved is liberated, the nascent gas being utilized wholly as far as practicable in the oxidation of the manganese dioxide. According to theory, the formation of 1,000 grammes of potassium manganate by the electrolytic oxidation of manganese dioxide in the presence of caustic potash, requires 81.2 grammes of oxygen, to produce which 272.5 ampère hours of current are necessary.

The manganese dioxide can be employed in the process either as part of the anode or in suspension in the electrolyte. Tests on the former method are described by Rapin *Chimie et Industrie,* April, 1935. In these trials the dioxide was compressed in an envelope of thin sheet metal pierced with small holes, the complete assembly functioning as the anode. The efficiency figures obtained, however, were not considered satisfactory enough to warrant this process being recommended.

In the second method, the electrolyte consists of a 90 per cent. potash solution, maintained in the fluid condition by heating to 200 to 210° C. The cathode is an iron point just penetrating the bath, while the anode is a band of platinum. Trials carried out by Rapin showed that slight liberation of oxygen commenced as soon as the anodic current intensity reached 12 ampères per sq. dm. For standard operating conditions, the liberation of free oxygen tends to increase as the electrolysis is prolonged.

The further electrolytic oxidation of potassium manganate to potassium permanganate can be effected in cells with diaphragms and cells without diaphragms, but the present tendency is to operate in plant of the latter type, and the following working conditions have been found to give satisfactory results: Anodes and cathodes, both constructed of iron; anodic current density, from 0.08 to 0.1 ampères per square c. m.; cathodic current density, 0.85 ampères per square c. m.; current voltage, 2.8; and temperature of working, 60° C. Under these conditions the current efficiency is about 55 per cent., meaning a consumption of 0.8 to 0.9 kwh. per kilog of permanganate produced. Attempts have been made to improve the yield by substituting platinum anodes for iron anodes, but no improvement in the consumption of electricity per unit weight of permanganate made was found.

A number of processes have been proposed and operated for the direct electrolytic production of potassium permanganate by employing an anode of metallic manganese or a manganese alloy. The Lorenz method, which dates back to 1896, electrolyzes a solution of caustic potash between an anode of metallic manganese and a cathode of copper oxide. Formation of permanganate round the anode commences at a voltage of 1.5, and becomes quite important at a voltage of 2. The permanganate separates from the anode and settles at the bottom of the anodic compartment. Crube and Metzger, *Z. Electrochem.*, 1923, used anodes of pure manganese in a 40 per cent. solution of potassium carbonate. Working at ordinary temperatures and with a current density of 0.14 ampères per square c.m., the current efficiency was found to lie between 20 and 30 per cent.

Ferro-Manganese Anodes

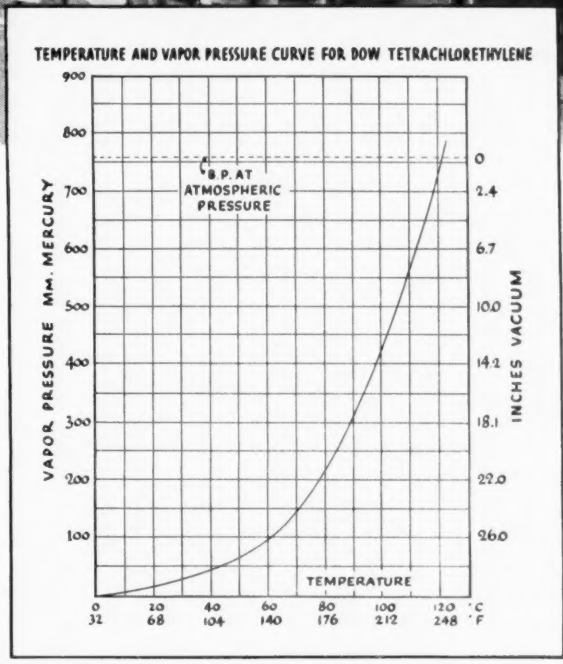
First trials on the use of anodes of ferro-manganese were reported by Thompson in the U.S.A. in 1919. This worker operated with anodes containing 75 per cent. of manganese, with an electrolyte consisting of a 20 per cent. solution of potassium carbonate and a current density of 0.075 ampères per sq. c.m. The current efficiency in respect to potassium permanganate production was 17 per cent. If the electrolyte contained free caustic alkali, or if the working temperature rose to 40° C., a protective layer of manganese dioxide, which prevented all further reaction, formed round the anode.

Wilson and Horsch, also in 1919, in the U.S.A., studied the same problem, using an anode, ferro-manganese containing 78.5 per cent. of manganese and an electrolyte consisting of a 12 to 14 per cent. solution of sodium carbonate. Working at 30° C., with a current density of 0.07 ampères per sq. c.m., they obtained a current efficiency of 35 per cent. The same difficulties experienced by Thompson were encountered, and Wilson and Horsch found it necessary to clean the anodes by means of a sand-blast every twenty-four hours.

The problem has since been studied by further workers, and as a result the following conclusions may be drawn: The ferro-manganese should contain at least 40 per cent. of manganese; below this, permanganate is not formed, above this figure the yield increases with the percentage of manganese in the alloy. The best results are obtained with an alloy containing 80 per cent. of manganese. The temperature should be as low as possible, and the best conditions appear to be a current density of 0.06 ampères per sq. c.m., when the current efficiency is about 30 per cent. There seems no way of preventing the formation of a coating of manganese dioxide on the cathode, and this latter should be removed and cleaned periodically. Rapin, *Comptes Rend.*, 1928, has proved that it is essential that the ferro-manganese anode be a compact block, an anode made of the powdered mineral and compressed being quite useless. It has also been shown that 2 per cent. of cobalt in the ferro-manganese completely prevents the formation of permanganate.

Silico-Manganese Process

Employment of an anode of silico-manganese is proposed in French Patent 675,477, the advantage claimed over ferro-manganese being that the former disintegrates more regularly and is less liable to be coated with an insulating layer of oxide.



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The specification describes the electrolysis of a caustic potash solution of 30° Bé. between anodes of silico-manganese, containing 66 per cent. of manganese and 23 per cent. of silicon, and an iron cathode. The current density is 2 ampères per sq. c.m., and the temperature 60° C. There is eventually obtained an aqueous alkaline solution containing potassium manganate and permanganate and potassium silicate and a deposit of crystallized permanganate. The current efficiency in regard to permanganate is given as 31.5 per cent. It has been found that if the concentration of potash solution rises to 52° Bé., only the manganate is formed.

Kerosene as Petroleum Absorption Medium

The Southern Minerals Corp. of Corpus Christi is now nearing its second month of continuous operation of an absorption plant in the Saxet field of Nueces County, and further expansion of its facilities is already in progress. The rapidly developing crude and gas production in the Saxet field has far exceeded original estimates of company engineers, and at the outset of operations, the plant is running in excess of capacity.

Plans for enlargement of the plant have been completed; the new additions doubling present capacity of the unit. Expenditure for the new project will cover a duplication of the present absorber, a 255-ton refrigeration system, and a propane-butane recovery unit.

Frio Gases Productive

With the additional units, the company proposes to process 35,000,000 feet of gas. The major portion of the increase in gas take will be from the deeper productive zones in Saxet; namely, the 6,300-, 6,700- and 6,900-foot sands.

Construction of the original plant was begun in early January. The company has included in the plant gathering system, the production not only of its own wells, for it is a major producer in the field, but also that from leases of other operators who have production from the Frio horizons of Saxet. The unpredictable expansion of this horizon and the addition of further reserves in lower sands, however, brought the supply to a figure far exceeding the capacity of the plant as originally designed.

In a survey made last year, the gas produced with 38.4-gravity crude in the 5,800-foot Frio horizon was found to be the only type in the field suitable for the manufacture of natural gasoline. Other sands, such as the 4,400-foot and 4,500-foot Clarkwood, the 4,800-foot New Saxet and the several shallow horizons produced a gas too dry for consideration. The added reserves opened in the Frio sands below 6,000 feet since the first of the year, however, have shown a content similar to the 5,800-foot gas, and have greatly enlarged the supply of wet gas available to the company.

The analysis of a typical sample of the 5,800-foot gas, which represents the principal current charge to the plant is shown below:

Component—	Pct. by volume
Methane	84.67
Ethane	6.57
Propane	4.76
Iso-butane	1.15
N-butane	1.40
Iso-pentane	0.44
N-pentane	0.32
Hexanes and heavier	0.69

The new plant is the conventional well-pressure type of absorption unit, utilizing a 41-gravity kerosene as the absorption medium. The oil circulating pumps are steam turbine-tandem driven units. A 7-foot primary absorber and a 2-foot reabsorber, having 16 trays each, provide sufficient contact of the counter-current fluids for absorption of the heavier gas fractions. At present, with a total gas take of 27,000,000 feet per day, the primary absorber is operated at a pressure of 38 pounds gauge. The plant was originally designed to handle 20,000,000 feet at 30 pounds, but the unexpected expansion of field supply has necessitated the change in operating conditions at a 35 per cent. overload.

Features of the combined still and dephlegmator include a built-in vent section, and heat elements in the two bottom trays of the column. These built-in heat elements operate to permit a reduction in partial pressure steam requirements because of higher temperature in the still base. Exhaust steam from the make room pumps is superheated and serves as the agitation steam required in the still.

Stabilizing Equipment

The 30-tray stabilizer is of conventional design, equipped with an atmospheric type reflux condenser and an outside kettle or reboiler, connected to the column base. The cooling tower is an open type, eight-bay unit. A pump pit has been provided to allow a slight head on the suction side of the cooling water pumps. The steam turbine-driven pumps are duplicated for stand-by service, and the piping for one of the units has been so arranged that the pump serves the plant yard fire system.

Steam generation is handled by four 200-pound working steam pressure, 125-hp. oil-country boilers. These are operated in a three-stage system, consisting of one atmospheric heater and two condensate receivers. The low-pressure receiver operates at 40 pounds and the final receiver at 125 pounds gauge. Condensate from the preheater and superheater is returned to the latter. This arrangement gives a final feed-water temperature of 353° F. In as much as the plant is supplied with water from a line nearly 3 miles away, a 2,000-bbl. emergency storage tank is installed directly behind the boiler house. From an article by George Weber, *Oil & Gas Journal*, May 6, '37, p. 52.

Benzol Dehydration

A process for drying benzol, tried out successfully in a number of Ruhr works, depends upon the use of caustic soda, and is due to H. Kiemstedt, who has found that both solid caustic soda and caustic-soda lye of moderately high concentration are capable of rapidly removing the emulsified and dissolved water from technical hydrocarbons. According to a description of the process, given by Kiemstedt, *Brennstoff-Chemie*, 18, 23-24, 1937, a multi-stage method is being adopted in some works, the benzol containing most water being treated with solid caustic and the material so pretreated being subjected to the action of caustic lye obtained by the dilution of the solid caustic. When too dilute to be employed for dehydration, the caustic lye goes to the refining department.

The caustic soda in lump can absorb up to about 100 per cent. of its weight of water from benzol without losing its lump form. No chemical drawbacks were found in the process. The benzol can be dehydrated directly before loading for despatch by passage through a caustic-soda filter. A better practice, it is suggested, is to pump the benzol from one container to another through a caustic-soda filter. The consumption of caustic is given as about 0.25 kilogs per ton of benzol calculated on the final caustic being discarded from the process at a concentration of 33 per cent. The cost of drying benzol by this method is estimated at about 1 Rpf. per ton, the comparable cost with calcium chloride is given as 5 to 8 Rpf., while with silica gel it is considerably higher than this.

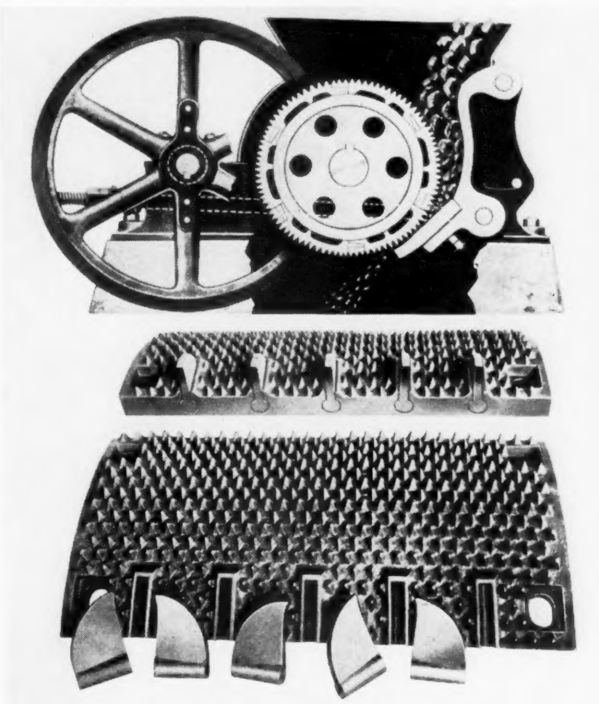
New Equipment

Prevention Silicosis

To combat Silicosis, U. S. Rubber Products, Inc., 1790 Broadway, New York, has designed new Blower and Dust Suction Hoses to meet practically every known conveying condition. Dust Hose—Official P-5508 (for abrasives) is designed for either suction or light pressure, such as that generated by a blower. It will successfully withstand the abrasive action set up in the conveyance of various abrasive types of particles The carcass of the hose is supported by a steel wire helix and is as light as is consistent with long-wearing qualities. Blower Hose (for fumes only), Official P-5509, is similar to the Dust Conveying Hose with respect to carcass construction and wire reinforcement. As it is offered for blowing service where mainly fumes or gases are conducted and is not designed for conducting abrasives, a lighter construction and a compounded tube are employed.

Single-Roll Crusher

A single-roll crusher specially designed for the preparation of stoker and smaller size coal with a minimum of degradation and oversize is announced by Jeffrey Manufacturing Co., Columbus, Ohio. Its renewable segments carry thin, sharp pyramid and spear-point teeth, also insertable "Wejtite" feeder teeth for use where reduction of large coal is required. These teeth, together with the pattern of their spacing, minimize degradation by causing a piercing action rather than a mashing action. A new breaker plate design eliminates boiling of the feed and therefore increases the capacity. An extended shoe carries the business zone farther along the roll to minimize oversize.



Improved Magnetic Separator

Stearns Magnetic Mfg. Co., Milwaukee, Wis., has made some radical changes in the design of its Type "Q" magnetic separator. This unit has been perfected for separation of free iron from finely ground material by an inductively magnetized vibrating screen. It is entirely enclosed and self-contained. The feeder has been lowered for greater convenience where hand labor is used. Roller bearings of rugged construction are now used throughout. Adjustment of the vibrating screen belt has been arranged to allow alignment by a single operation and insures absolute alignment of the belt on the pulleys at all times. The vibrator mechanism has been redesigned to provide for changing the degree of intensity in vibration.

Booklets & Catalogs

Companies whose booklets are reviewed on this page will be glad to supply readers of "Chemical Industries" with copies free, provided this magazine is mentioned and the request is made on company stationery. Your business title should also be given.

Chemicals

Accident Facts, 1937 edition, contains accident statistics for previous year and comparisons with earlier years. Compiled by National Safety Council, 20 No. Wacker Drive, Chicago, Ill.

Brimstone Brevities, June 1937, articles, quotations and literature references relating to uses of materials in which sulfur plays a role, with patricular emphasis on its agricultural value. Freeport Sulphur Co., 122 E. 42nd st., N. Y. City.

Buffing Lacquer, No. 950, clear, cellulose type, air-drying flexible lacquer which resists discoloration by sunlight; **Flexible Silver Lacquer No. 5985,** for blanking, forming, printing or lithographing without chipping, flaking, or peeling; **Blue Knight Ba-Flex,** baking, flexible lacquer enamel. Leaflets from Roxalin Flexible Lacquer Co., Inc., Elizabeth, N. J.

Caustic Soda, illustrated brochure lists characteristics, handling of solid, flake, and ground caustic, and gives conversion tables. Pennsylvania Salt Mfg. Co., 1000 Widener Bldg., Phila., Pa.

Dyestuffs, June 1937, several unusually interesting articles on textile manufacture and dyeing methods. National Aniline & Chemical Co., 40 Rector st., N. Y. City.

Functions of the Traffic Manager, report on activities of companies in a broad selection of industries to assure efficient and economical transportation of their products and materials they purchase. Policyholders Service Bureau, Metropolitan Life Insurance Co., 1 Madison ave., N. Y. City.

Givaudanian, June 1937, features data on suntan chemicals. Givaudan-Delawanna, Inc., 80 50th ave., N. Y. City.

Neoprene, handbook, specific applications, summary method of manufacture, and chemical composition. E. I. du Pont de Nemours & Co., Wilmington, Del.

New York Laws Affecting Business Corporations, (Annotated), 18th edition, revised to June 7, 1937, containing Amendments of the Legislative Session which adjourned May 7, 1937. Retail price, $2.00. United States Corporation Co., 150 Broadway, N. Y. City.

Quarterly Price List, R. & H. Chemicals Dept., E. I. du Pont de Nemours & Co., Wilmington, Del.

Syan Blue B, first comprehensive laboratory report on characteristics and applications of what is claimed to be the first new blue pigment in more than a century. Ault & Wiborg, 75 Varick st., N. Y. City.

Synthetics Bring New Era in Perfumes, first chapter deals with changes which have occurred in art of perfume making, other chapters treat on perfume manufacture, and perfume usage in industrial processes and products. E. I. du Pont de Nemours & Co., Wilmington, Del.

Versatile Service of Bakelite Materials, response to oft-asked query: "What is Bakelite?" story of development of various Bakelite resinous materials, their general characteristics, properties and applications. Bakelite Corp., 247 Park ave., N. Y. City.

Equipment, Apparatus

Airless Rotoblast, leaflet describes latest addition to company's line of dust collectors and air blast equipment. Pangborn Co., Hagerstown, Md.

B-K Inhalator, salient and exclusive construction features and fields of service to which it is applicable given in leaflet. Pulmosan Safety Equipment Corp., 176 Johnson st., Brooklyn, N. Y.

Celoron Silent Gears, 8 pp. illustrated booklet contains rather complete treatment of adaptation of this laminated plastic material in manufacture of silent gears. Continental-Diamond Fibre Co., Newark, Del.

Dry Vacuum Pumps, Bulletin L-711-B2, devoted to features and high volumetric efficiencies claimed for this improved line of single-stage and two-stage horizontal pumps. Worthington Pump and Machinery Corp., Harrison, N. J.

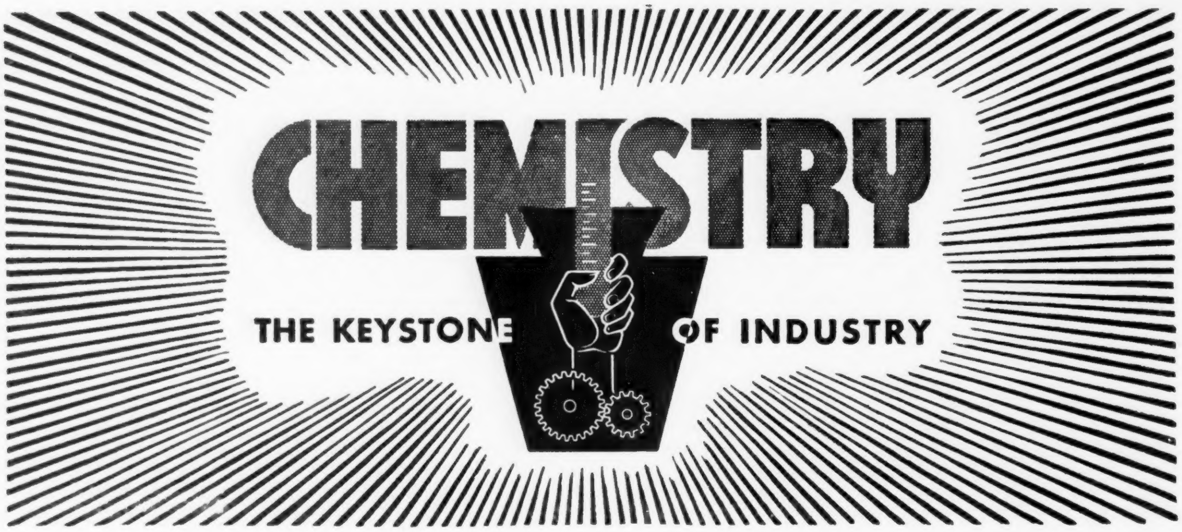
Imp Mill for pulverizing, drying, calcining, offering a broad range of applications for general purpose grinding, described in brochure which lists also various applications. Raymond Pulverizer Division, Combustion Engineering Co., 1315 No. Branch st., Chicago, Ill.

Importance of Proper Insertion of Creped Paper Linings, descriptive booklet prepared in response to many requests for information of this kind in order to obtain satisfactory results. Paper Service Co., Lockland, Cincinnati, O.

Laboratory, Vol. 9, No. 1, adequately lists new laboratory appliances for chemistry, metallurgy and biology. Fisher Scientific Co., 711 Forbes st., Pittsburgh, Pa.

R. & L. No. 3000 Refractory Cement, Bulletin R-31 describes its extensive application in setting brickwork and repair of refractory construction on boilers, industrial and domestic furnaces, coke ovens, and other high temperature processing equipment. Refractory & Insulation Corp., 381 4th ave., N. Y. City.

Welded Piping Design, complete handbook, 200 pp., gives information on design and layout of piping for welded connections, contains over 100 figures and tables. Linde Air Products Co., 30 E 42d st., N. Y. City.



SODIUM ORTHOSILICATE ANHYDROUS

Persistent research and development by Pennsylvania Salt Manufacturing Company has now made possible the large scale commercial production of *anhydrous* sodium orthosilicate, a greatly superior detergent for a variety of heavy-duty cleaning operations, offered to the trade under the name "Orthosil."

This product has a sodium oxide content of 62.5%. It is in the form of dry, white, free-flowing granules that dissolve readily in water. In solutions of low concentration it quickly removes oils, greases, paint, and similar materials from articles to be cleaned, and is applicable for all metals in common use except tin and aluminum. Hot solutions remove all soil normally found on steel except the scale which is removed by pickle acid.

Our highly specialized technical service is always available to help customers with their difficult problems.

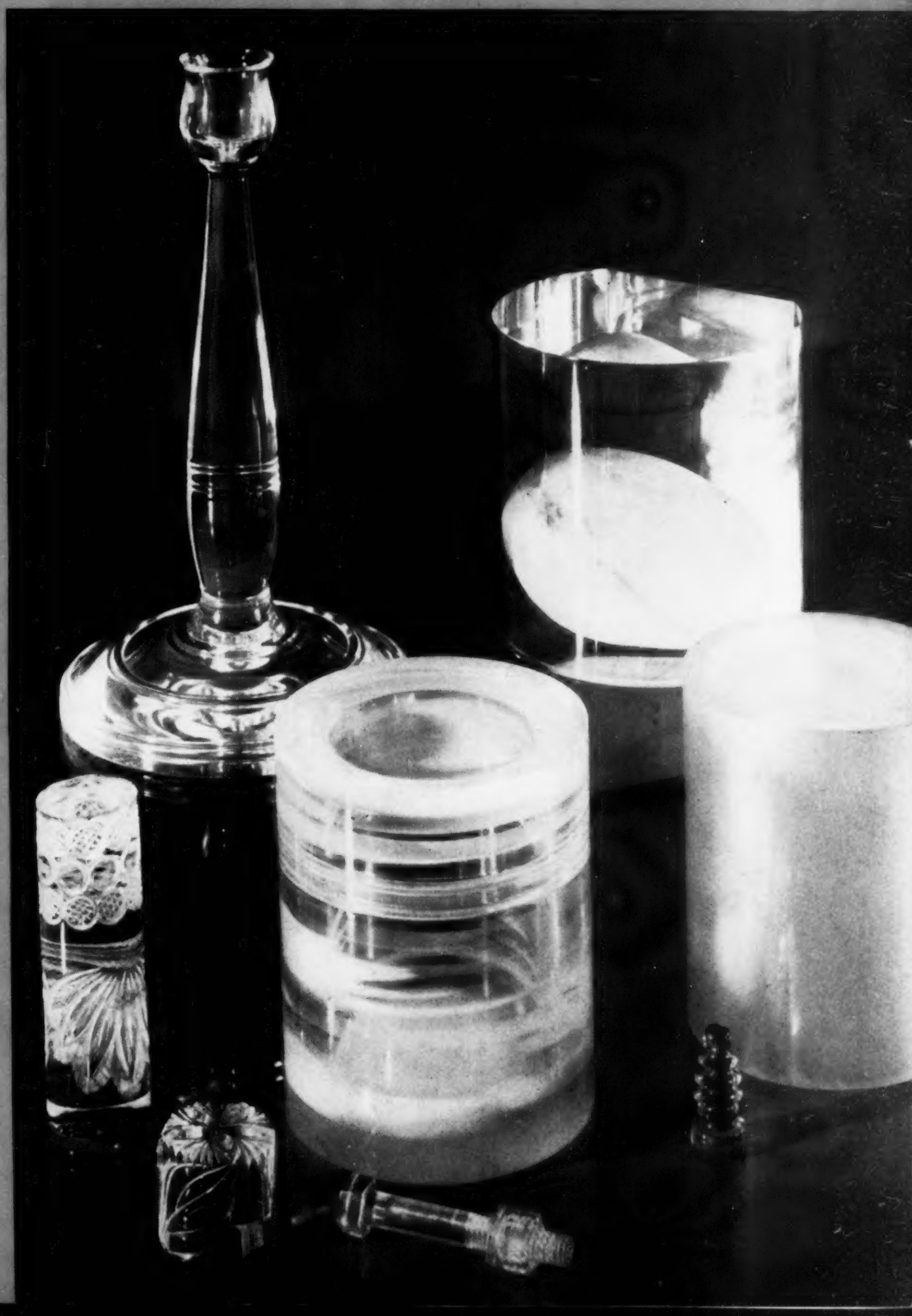
TRADE MARK

PENNSYLVANIA SALT MANUFACTURING COMPANY · Est. 1850
WIDENER BLDG., PHILADELPHIA, PA.
OFFICES: NEW YORK · CHICAGO · ST. LOUIS · PITTSBURGH · TACOMA · WYANDOTTE

PENNSYLVANIA SALT
Chemicals

New Products and Processes

A Digest of Chemical Uses and U.S. Patents



Lucite, the new duPont plastic, see page 125.

Odd Uses of Dyes

By F. Hill

ORDINARY soaps can be colored with either water-soluble or oil-soluble dyes, if the dyes chosen are fast to heat and alkali. Fancy toilet soaps are colored in a wide variety of shades, but in this case, more freedom in the choice of dyes is allowable, because the dye is not subjected to heat as is the case with household soap. The dyes are applied from aqueous solution to the soap chips. The chips are next cold milled, which ensures even distribution of the coloring matter throughout the mix. The colored material is then subjected to the final processes of plodding, extrusion, and tablet formation.

Floor, furniture, boot, etc., polishes of the straight wax or the more complicated hydrated cream types need to be colored. The wax type is made from wax, a dye of the Waxoline class, and a solvent; *e.g.*, turpentine or white spirit.

Hydrated creams are mixtures of a suitable wax, an emulsifying agent, water, turpentine, etc., together with a dye which must be fast to alkali and not interfere with the stability of the emulsion. For this purpose both water-soluble and oil-soluble dyes are used.

Sponges also are dyed now. The natural dark brown coloring matter is first bleached by immersion of the sponges for ½ hr. in 0.25 per cent. potassium permanganate solution. Excess solution is removed by squeezing and the sponges then treated in one per cent. sodium hydrosulfite solution. Finally, they are rinsed well in cold water, soaped in a one per cent. soap solution, and dyed with Caledon and Durindone dyes. Caustic soda cannot be used in the preparation of the vats, but reduction in presence of sodium phosphate yields dye baths which are quite satisfactory. After dyeing, the sponges are allowed to oxidize for 15 min., and then scoured in warm very dilute acetic acid. Finally, they are rinsed well in cold water and soaped for 10 min. in a one per cent. hot soap solution.

Bath salts are colored with dyes fairly fast to alkali by simply sprinkling a known volume of the aqueous dye-liquor on to the crystals, then churning the whole mass together until even distribution of the dye has been obtained.

Buttons are produced now from casein, vegetable ivory, horn, wood, synthetic resin, bone, and mother-of-pearl. Vegetable ivory is the most widely used material; it is known as coroza nut in South America, where it grows on the roots of the coroza tree. The button maker only uses the side of the nut, from which the button is turned out, dyed to the requisite shade and then polished. Vegetable extracts are widely used for dyeing this type of material, but level-dyeing acid dyes, *e.g.*, Lissamine Fast Yellow 2GS, Azo Geranine 2GS, and Solway Blue BS are being used satisfactorily. These dyes are applied from aqueous solutions at b.p.; acid is not used as it tends to split the buttons.

Buttons prepared from hardened casein are colored in two ways. Either the raw powdered material is colored with an aqueous solution of dye and then molded as required, *e.g.*, into rods, whereby the dye is caused to diffuse throughout the plastic mass which is then hardened by formaldehyde, or white casein hardened blanks are dyed directly. This process allows greater freedom in the production of a wide range of shades. The shades required vary from season to season. The after-dyeing of casein plastic is carried out by immersing the white blanks in a suitable dye-liquor containing a little formic acid at 70°-80° C. Acid dyes, *e.g.*, Coomassie Yellow RS, Naphthalene Red EAS, Naphthalene Scarlet RS, Disulphine Blue AS, and Naphthalene Black 12BS are suitable.

Mother-of-pearl cannot be dyed in the normal dyeing time. Basic dyes, *e.g.*, Auramine OS, Rhodamine BS, and Thionine Blue GOS, are employed and the "pearl" is immersed in the dye-liquor for periods varying between 2-5 days. It is necessary to degrease the "pearl" by treatment with caustic soda before dyeing to remove oil or grease used when machining the article from the shell.

In the production of buttons, horn is used to produce pearletted horn; *i.e.*, a material with a sheen or mother-of-pearl effect; this is done by treating the product with lead salts and forming, by double decomposition, an insoluble lead salt within the material. The dye is applied to the product before this treatment and the light is reflected through it by the metallic salt, so that a colored pearl effect is obtained.

Use of synthetic resins in button making is a fairly new departure. These materials can be dyed quite satisfactorily with aqueous solutions of basic dyes; "bronzing" is prevented by using up to 20 per cent. of Cellosolve on the volume of the liquor employed.

Wood is another product used in making fancy buttons and buckles for ladies' coats. The wood is first turned into the desired shapes and finished, then being ready for dyeing and polishing. Wooden buttons are dyed with dyes which are soluble either in industrial methylated spirit, or in benzine or solvent naphtha.

Ladies' satin shoes are stained in various shades to match the color of dance frocks. Both spirit- and water-soluble dyes are used, the dye solution being applied to the fabric by either brush or pad.

Ordinary colored inks are aqueous solutions of dyes containing a preservative. The ink used by draughtsmen has to be weatherproof; it is made by dissolving shellac in dilute borax solution and adding suitable dyes; *e.g.*, basic and acid dyes. Ordinary blue-black writing ink contains a tannin, a soluble iron salt, a little acid to keep the iron tannate in solution, and a dye; *e.g.*, Ink Blue, to make the writing visible. Hectograph inks are prepared by dissolving basic dyes in a suitable medium; *e.g.*, a mixture of water, acid, methylated spirit and glycerol. This type of ink is applied to a suitable carrier; *e.g.*, a gelatin bed, and from this master script a series of copies can be taken.

Inks used for stamp pad work are prepared by dissolving basic dyes in a slow drying medium; *e.g.*, a mixture of glycerol and water, together with a little dextrin. Incidentally, it may be noted here that the so-called cold polishing ink, used in the shoemaking trade for staining and polishing the soles of shoes, consists of a mixture of shellac, borax, wax, and dye. The product is applied to the leather which is then mop polished to produce a glossy appearance.

Carbon paper is a special type of tough thin paper which has been coated with a colored wax by means of hot rollers. Dyes both soluble and insoluble in wax are employed for coloring the wax. Methyl Violet 10BPS is wax-insoluble, but it is very soluble in water and methylated spirit and is used to produce papers known as copying carbons. This type of carbon paper is employed first to produce a typed master copy, which is then placed in a suitable machine, and damped papers caused to come into contact with it, whereby copies of the original are obtained owing to the solubility of the dye in the solvents used in dampening the paper.

Typewriter ribbons are prepared by coating a suitable cotton ribbon with a dope produced by grinding a dye into a suitable carrier; *e.g.*, castor or mineral oil.

Indelible pencils are colored with a good quality dye of the methyl violet type. Acid and basic dyes are used in the manufacture of colored copying pencils; *e.g.*, blue, red, green, yellow, crimson, and brown. A recent type of pencil for laundry-marking purposes consists of a mixture of carbon black with a direct cotton dye and a basic dye.

Sealing waxes are made from mixtures of resins, fillers, and dyes. The resin is melted, the filler and dye added, and dispersed properly in the medium; the colored mix is then run out into a shape or mold.

Treatment of aluminum, etc., by the anodic process was first used a few years ago for producing films of oxides to prevent corrosion of the metals. This oxide coating for aluminum is hard, coherent and acts as a mordant for suitable dyes. The type of film influences the result; it is dependent largely on the kind of aluminum or alloy, as well as the electrolyte, employed. Some dyes work very satisfactorily under most conditions, and Solway Blue BS, Solway Green GS, Solochrome Brown MS, Solochrome Yellow YS, and various other products of the same groups, give excellent results. It is best to dye the coating as soon as the anodic treatment has been completed. The metal is rinsed first in cold water, placed in the dye solution, and dyeing allowed to proceed slowly, otherwise the dye will aggregate on the surface of the film and yield unsatisfactory dyeings.

Natural flowers and foliage are often dyed. Stems of freshly-cut blooms are placed in a dye solution, or the blooms are first treated with a solvent which reduces the interfacial tension between the solution and the petals, and then dipped in the dye solution. The latter method gives greater production; *e.g.*, a few seconds, compared with 4-8 hr. by the capillary method, are needed to yield satisfactory dyeings.

Ferns, honesty, statice, sea-moss, and beach leaves are dyed by simply immersing the material in a hot dye solution until the necessary depth of shade is obtained.

Insecticides, etc., *e.g.*, arsenical products, are colored in order to prevent their accidental use for other purposes.

Seeds are dressed prior to sowing to protect them from pests. The dressing contains a small amount of a petrol-soluble dye; *e.g.*, Agrosan G, for future identification of batches by immersion of a few seeds in petrol.

Hydrocarbon solvents are often "whitened" by dyes, and motor greases are colored. A red dye, *e.g.*, Waxoline Red EPS, is used in petrol, primarily to indicate presence of a toxic substance, *e.g.*, lead tetraethyl, by coloring it pink. On the other hand, aviation spirit, which contains the same anti-knock agent, is colored blue. Waxoline Green 2451 is also used when the petrol companies desire to color their products to a particular shade for identification purposes.

A "whitening" dye, *e.g.*, Waxoline Blue 01000, soluble in the medium, is used to counteract the slightly yellowish tint of liquid hydrocarbons.

Dyes used for motor greases are of a yellow, orange, or brown tint; they need to be fast to heat and alkali.

Apart from their occasional use in coloring furniture wood veneers, dyes are widely used for coloring toys, pipes, wooden spills, baskets or skips, cotton reels, golf tees, wicker used in basket making, etc.

All wood used in a motor car is treated with a fungicide and, in order to enable the operatives to know that the wood has been treated, the solution is colored with a black Waxoline dye. Other wood preservatives, which have creosote as their basis and which are used for outdoor purposes, also contain coloring matters; *e.g.*, soluble Waxoline dyes or pigments.

Belting, twine, and ropes are also treated with colored preservatives.

Celluloid is colored with dyes soluble in appropriate solvents, although pigment colors are used where opaque results are required.

Surface coloration of pre-formed Celluloid articles is done with solutions of dyes in a mixture of solvents; *e.g.*, acetone and ether. Ether prevents excessive swelling of the Celluloid.

Transparent paper made from viscose is dyed with direct cotton and basic dyes.

Viscose caps for bottles are dyed similarly, while Fixanol dyes are used where the dyed results are required to be fast to water-bleeding.

Metal wrapping foils with plain- or multi-colored surfaces are used a great deal for wrapping purposes. The colors are produced with lacquers containing basic dyes.

Multicolor or "marbled" effects on book edges are produced as follows: a mucilage made from Carragheen moss and water is placed in a tray and on to the surface of this mucilage, *i.e.*, the "carrier," drops of various Chlorazol dye solutions are placed. A piece of wood, into which a number of nails have been driven, in order to produce a comb-like effect, is then passed across the surface of the carrier so as to cause the drops of dye solution to assume a wave-like formation. The edges of the ledger are then placed in contact with the colored surface of the carrier and, in consequence, the colored wavy effect is transferred to the edges of the paper.

Two methods are used in coloring match compositions. A concentrated dye solution, made from basic dyes, *e.g.*, Rhodamine B500, Magenta Crystals, and Victoria Blue B150, is mixed thoroughly with the composition before application to the match heads; or the completed match heads are dipped into an alcoholic solution of basic dye.

Reference was also made to the coloring of alkaline arsenical sheep dips; water for swimming baths; candles; wax tapers; and stick wax. Stick wax and heel ball are used on the edges of shoe soles and heels to produce a glossy finish. The wax is colored to give a shade compatible with the tone of the rest of the shoe.

Alabaster is now receiving the attention of the colorist. The natural product contains a high percentage of moisture. If the material is dried and then placed in a solution of dye, the latter penetrates throughout the alabaster.

Abstracted from summary of an address delivered by the author at a meeting held at Dyers Hall, Dec. 11, '36.

Textiles

Metal Antioxidants for Wool Oils

In a patented process from Holland tin (stannous) compounds soluble in oil retard oxidation very greatly when present in an amount equivalent to about one-tenth per cent. of tin.

Oils oxidized on the fiber cause direct damage and sometimes fires, and heating which is not sufficient to cause ignition may cause stains and discoloration. Oxidizing catalysts may be one of the main causes. Certainly unsaturation as measured by iodine value alone is not the sole determining factor because small amounts of the more highly unsaturated acids might be very troublesome but not have a particularly high iodine value (in the oil as a whole).

In general, the presence of metals, that is, traces of soaps of such metals as copper, lead, manganese and iron, is suspected of promoting oxidation. Moisture also accelerates it.

Among the retarders are pyridine bases and sulfonated oils and a number of organic substances such as beta naphthol and aromatic amines. Some organic antioxidants have desirable properties but are also harmful, causing stains by oxidation or in contact with alkalies. Some are poisonous or have objectionable odors.

The tin compounds avoid some of these disadvantages. An example is stannous oleate. Hydrated stannous oxide, washed with water and alcohol, is allowed to react with oleic acid under rather particular conditions (apparently to avoid oxidation to the stannic form) to be found in detail in *Textile Manufacturer*, Nov., '36.

Stating the result of using such a compound in terms of the Mackay test, a tenth per cent. of tin will keep the temperature of olein below 105° C. for more than three hours. The effects of several tin compounds (oleate, stearate and benzoate) have been found to be the same for equal amounts of the actual tin present.

It is believed, on the basis of experimental evidence, that the

stannous compounds act by the reduction of highly catalytic oxidation products which may already be present. The usual organic antioxidants are supposed to act by removing oxygen until they are rendered inactive by their own oxidation. They delay the onset of oxidation or prolong the induction period but do not affect the velocity of oxidation when it has once begun. The stannous compounds are claimed not only to prolong the induction period very greatly but also to diminish the velocity of the oxidation process when it finally begins.—*Technical Bulletin,* Series A, No. 45, Oct. '36, International Tin Research & Development Council.

"Bean-Silk"

A Japanese corporation has been organized to convert soybean stems into rayon yarn.

Crystalline Dextrose

In producing a high-purity dextrose from a starch-converted solution by crystallization, a relatively constant vacuum is maintained during stage at which the dextrose is deposited from solution on the nucleus crystals; as the operation proceeds temperature is reduced by adding fresh solution faster than the water content is evaporated so as to gradually reduce the B. P. of the solution; near the end of operation, water is added and boiling continued. U. S. P. 2,065,724.

Sizing Agents

Use of a cold water-soluble cellulose paste as a sizing agent, particularly for staple fibers, and emulsions of synthetic waxes for rayons and staple fibers, is described in *Seide u Kunstseide,* 1937, **42**, 84-87.

Rot-proofing Jute

Jute fibres and yarns and fabrics made therefrom are rot-proofed by treatment with boiling solutions of cutch and potassium bichromate so that an insoluble chromium-containing organic compound is deposited on the fibres in an amount, calculated as metallic chromium, between 2 and 2.5 per cent. of the weight of the fibre. In the example, the material is first boiled in a 3.3 per cent. aqueous solution of cutch for three hours, and then boiled in a 1.5 per cent. solution of potassium bichromate for twenty minutes, after which it is washed free from bichromate and dried. E.P. 462,306, '35.

Delustering Rayon

Recently new methods of delustering rayon with tin compounds have been considered, and they appear likely to be useful to hose finishers since they apparently allow delustering to be produced which is both permanent and level. Definite reasons why these new processes should be more satisfactory than those at present in use, is discussed in an article, "Delustering Rayon with Tin Compounds," *Textile Colorist,* 1937, p. 317.

New Dyes

General Dyestuff releases include: Palatine Fast Red LBN of good fastness to light, water, salt-water, washing, and light fulling. It is especially recommended for dyeing carpet, knitting and hosiery yarn, men's wear and ladies' dress goods. Supra Light Yellow GGL is a new acid yellow brought out by I. G. and offered by General Dyestuff. Its principal advantage is its excellent fastness to light. It is of very good solubility and levels well from a Glauber's salt-sulfuric acid bath.

Du Pont announces: Acetamine Violet 2R, yielding very reddish shades of violet on acetate fiber yarn and pieces. It is useful for self shades, as a red shading element, and as a base for wine, burgundy, claret and similar tones. Sulfogene Fast Green YCF (Patent applied for) is a sulfur color similar in general characteristics to Sulfogene Fast Green BCFN but much yellower and brighter in shade. It is dyed in the customary manner and best results are obtained with the use of an equal amount of sulfide and color. Celanthrene Brilliant Blue 2G is applicable to all forms of acetate materials; is brighter and considerably greener in shade than Celanthrene Brilliant Blue; has good resistance to light even in pale shades and is recommended for producing light blues which also have good fastness to washing. Dyers of men's hosiery will find it of interest as a coloring medium for acetate effects in pastel shades.

Chemical Theory of Acid Dyeing

Arthur Smith and Milton Harris, Textile Section, National Bureau Standards, in studying the reaction of wool with acid dyes, have determined the acid dye-combining capacity of untreated wool and have shown it to be equal to the acid-combining capacity. Treatment with nitrous acid, hydrogen peroxide, sodium hypochlorite, and strong solutions of sulfuric acid decreases the basicity of the wool and correspondingly decreases the affinity for acid dyes. Chlorinated wool absorbs acid dyes at a greater initial rate than untreated wool, but at equilibrium the latter absorbs more dye. The resist to acid dyes produced in the sulfuric acid carbonizing process is caused by the conversion of basic amino groups to sulfamic acid derivatives.

New Synthetic Fibre

A synthetic fibre, with excellent prospects for such purposes as filter cloths, consisting of a vinyl polymerization product, will be manufactured by I. G. at its new Wolfen works. Fibre begins to soften at temperatures of 100° C., so is not suitable for clothing. It is very resistant to action of acids and alkalis, and about fifteen times as permanent as cotton filter cloth.

Miscellaneous

Bleaching Ground Wood

Zinc hydrosulfite is being successfully used on the Canadian Pacific Coast for bleaching groundwood for newsprint production in a process controlled by Western Electro Chemical, Pittsburgh, Calif. Discussing development, *Canadian Chemistry and Metallurgy,* May 1937, states that the advantages are: it has been possible to increase percentage of groundwood pulp in specialty papers where strength is of no particular consequence; to substitute unbleached for bleached sulfite pulp in mixture with groundwood, owing to much improved color of the latter; Kraft pulp can be brightened to a degree which is almost proportional to the amount of zinc hydrosulfite added, although chlorine is more economical for the lighter yellow shades which require high addition of hydrosulfite; unbleached sulfite and soda can be touched up by addition of 0.5 to 1% zinc hydrosulfite.

Chlorinated Hydrocarbons in New Rôle

Commercial introduction of chlorinated non-inflammable and non-explosive dielectric hydrocarbons into the manufacture of oil-filled transformers has been successfully carried out, according to F. M. Clark of General Electric. A typical material is prepared by blending trichlorobenzene and chlorinated diphenyl with a chlorine content of 60%. Other materials which may be used to advantage are pentachlorodiphenyloxide, pentachlorodiphenyl ketone, and hexachlorodiphenylmethane.

Rubber-Asphalt Road Surface

A large-scale experiment in road surfacing has begun in Canford Cliffs Road, Poole, England, where an area of 4,500 sq. yds. is to be laid with a combination of asphalt and rubber. Experiment arises from joint research conducted at the Imperial Institute, So. Kensington, London, and small scale experiments have shown that a combination of the two materials—in proportions which will not be disclosed until the completion of the larger trial—gives a rough granular surface which has non-skid qualities well worth more extended test.

Physical Constants for Some Simple Naphthene Hydrocarbons

Hydrocarbon—	Formula	Molecular weight	Specific gravity 60/60	Boiling point °F.	Melting point °F.	Latent heat B.t.u./lb.	Heat of combustion B.t.u./lb.	Octane No.
Cyclopropane	C_3H_6	42	...	—31	—193	...	.....	..
Cyclobutane	C_4H_8	56.1	.691	53	—112	...	.....	..
Methyl cyclopropane	C_4H_8	56.1	.661	40	...	...	.....	..
Cyclopentane	C_5H_{10}	70.1	.753	121	...	...	.....	..
Methyl cyclobutane	C_5H_{10}	70.1	.753	104	...	...	.....	..
Dimethyl cyclopropane	C_5H_{10}	70.1	.660	70	...	...	.....	..
Cyclohexane	C_6H_{12}	84.1	.783	117.4[11]	43.5[10]	153	20,100[11]	77
Methyl cyclopentane	C_6H_{12}	84.1	.754	161.2	...	...	.....	..
Ethyl cyclobutane	C_6H_{12}	84.1	.750	162	...	...	20,100[11]	82
1-1-2 Trimethyl cyclopropane	C_6H_{12}	84.1	.682	134	...	...	.....	..
1-2-3 Trimethyl cyclopropane	C_6H_{12}	84.1	.688	151	...	...	.....	..
Cycloheptane	C_7H_{14}	98.1	.817	244	...	143	19,800[10]	..
Methyl cyclohexane	C_7H_{14}	98.1	.774	216	...	138	20,080[10]	..
1-1 Dimethyl cyclopentane	C_7H_{14}	98.1	.759	189.5[11]	..	146	.....	..
1-2 Dimethyl cyclopentane	C_7H_{14}	98.1	.75	197.2[11]	...	146	20,100[10]	..
1-3 Dimethyl cyclopentane	C_7H_{14}	98.1	.750	195.3[11]	...	146	19,810[10]	..
Ethyl cyclopentane	C_7H_{14}	98.1	...	217.4[11]	...	...	.....	..
Cyclooctane	C_8H_{16}	112.1	.84	296	52[10]	...	.....	..
1-1 Dimethyl cyclohexane	C_8H_{16}	112.1	.774	245	...	129	22,600[10]	..
1-2 Dimethyl cyclohexane	C_8H_{16}	112.1	.795	262.4[11]	...	128	.....	..
1-3 Dimethyl cyclohexane	C_8H_{16}	112.1	.772	248[11]	...	...	22,520[10]	..
1-4 Dimethyl cyclohexane	C_8H_{16}	112.1	.781	251[11]	..	...	23,400[10]	..
Ethyl cyclohexane	C_8H_{16}	112.1	.79	269.4[11]	...	...	.....	..
1-Methyl 2-ethyl cyclopentane	C_8H_{16}	112.1	...	255.2[11]	...	...	.....	..
1-Methyl 3-ethyl cyclopentane	C_8H_{16}	112.1	.767	249	...	...	.....	..
1-2-4 Trimethyl cyclopentane	C_8H_{16}	112.1	...	235.4[11]	...	...	.....	..
n-Propyl cyclopentane	C_8H_{16}	112.1	...	268.3[11]	...	...	.....	..
Cyclononane	C_9H_{18}	126.1	.779	278[11]	...	...	.....	..
1-1-3 Trimethyl cyclohexane	C_9H_{18}	126.1	.785	280	...	...	.....	..
1-2-4 Trimethyl cyclohexane	C_9H_{18}	126.1	.803	291.2[11]	...	...	.....	..
1-3-4 Trimethyl cyclohexane	C_9H_{18}	126.1	.790	283	...	...	25,200[10]	..
1-3-5 Trimethyl cyclohexane	C_9H_{18}	126.1	.785	280.4[11]	...	...	.....	..
1-Methyl 2-ethyl cyclohexane	C_9H_{18}	126.1	.808	304	...	...	.....	..
1-Methyl 3-ethyl cyclohexane	C_9H_{18}	126.1	.801	301	...	...	.....	..
1-Methyl 4-ethyl cyclohexane	C_9H_{18}	126.1	.801	302	...	...	.....	..
Propyl cyclohexane	C_9H_{18}	126.1	.796	308	...	...	.....	..
Isopropyl cyclohexane	C_9H_{18}	126.1	.802	295	...	...	.....	..
Ethyl cycloheptane	C_9H_{18}	126.1	.817	326	...	...	.....	..
Tetramethyl cyclohexane	$C_{10}H_{20}$	140.2	.80	302	...	...	.....	..
1-Methyl 4-isopropyl cyclohexane	$C_{10}H_{20}$	140.2	.816	340	...	...	.....	..
1-3 Diethyl cyclohexane	$C_{10}H_{20}$	140.2	.799	338	...	...	.....	..
Pentamethyl cyclohexane	$C_{11}H_{22}$	154.2	.801	361	...	...	.....	..
Hexamethyl cyclohexane	$C_{12}H_{24}$	168.2	.806	387	...	...	.....	..

In this table, the specific gravities were brought to the common basis of 60° F. by computations.

REFERENCES:

10. Brooks, B. H., "Chemistry of the Non-Benzenoid Hydrocarbons," Chem. Catalog Co., 1922.
11. Rossini, F. D., "Chemical Constituents Separated in A.P.I. Project," The Oil and Gas Journal, May 16, 1936, page 64.

Physical Characteristics Hydrocarbons

For many years naphthene hydrocarbons were confused with paraffin hydrocarbons because they are both saturated types, or, in other words, do not react readily with most chemicals. The naphthenes are the predominant series of hydrocarbons in almost all oils.

These hydrocarbons are ring structures somewhat like benzene, although the number of carbon atoms in the ring ranges from three to nine for the hydrocarbons now known, whereas the benzene ring always contains six atoms. Furthermore, the ring structure is different from benzene, because all of the chemical bonds or affinities are satisfied with hydrogen atoms rather than being free to combine with other chemicals. Benzene can be converted to cyclohexane by adding hydrogen, but we have discovered no direct way to reverse this transformation to form benzene from cyclohexane.

The number of carbon and hydrogen atoms in the naphthene hydrocarbons is the same as for the corresponding olefin hydrocarbons, but the internal structure is different. This relationship, which is referred to as isomerism, is common among hydrocarbons. Among the higher boiling or high molecular weight hydrocarbons, isomerism is particularly common, and the scores of compounds having the same type formula but different structural formulae are doubtless responsible for much of our difficulty in identifying these compounds. Some authorities believe that several thousand different hydrocarbons are present in petroleum. W. L. Nelson, in *Oil & Gas Journal.*

New Plastic Material

Vulcaplas, oil-resistant, odorless, vulcanizable thermoplastic, has been developed by Imperial Chemical Industries, Ltd. It is a raw material, supplied only as a straight, uncompounded product. It does not possess the elongation and tensile strength of natural rubber, but may be mixed with either natural or synthetic rubber to give compounds with outstanding resistance to oils and solvents, allied with normal rubber-like qualities.

Selenium and Fatty Acids Reaction

Possibility of a method for preparation of pentadecane and nonadecane by dehydration of fatty acids in presence of selenium, is indicated by work carried out by S. H. Bertram, *Chemisches Weekblad,* '36, p. 457, on heating mixtures of stearic acid and selenium.

New Use for Activated Carbon

Activated carbon has been suggested as a safe, efficient and economical agent to free air-conditioned buildings of odors, according to a report to the A. C. S. Intensity of odor is determined by a freezing method aided by the osmoscope.

Leather from Seaweed

Manufacture of synthetic leather from seaweed found in the Thames estuary and the shores of the Isle of Thanet will be undertaken in a factory to be opened at Gravesend, England. English report states that new fabric can be made more cheaply than any comparable material, and is more durable than ordinary leather.

U. S. Chemical Patents

A Complete Check—List of Products, Chemicals, Process Industries

Agricultural Chemicals

Treatment residual gases formed in production of calcium cyanamide from ammonia. No. 2,086,171. Rolf Neubner, Piesteritz, near Wittenberg, Germany, to Bayerische Stickstoff-Werke Aktien-Gesellschaft, Berlin, Germany.

Apparatus

Apparatus for drying and treating wet granular materials. No. 2,083,756. Gustave Andre Vissac, Calgary, Alta., Canada.
Heated drum apparatus for desiccating liquids and semi-liquids. No. 2,084,537. Wilhelm Sasse, Weimar, and Ernst Schneider, Uerdingen-am-Rhine, Germany, to Buell Combustion Co., Ltd., London, England.
Apparatus for rendering pulverulent materials fluent. No. 2,084,546. Nikolai Ahlmann, Copenhagen, Denmark, to F. L. Smidth & Co., New York City.
Method and apparatus for recording temperatures of hot bodies. No. 2,085,508. Paul Neubert, Leverkusen-I. G.-Werk, Germany, to I. G., Frankfort-am-Main, Germany.
Apparatus for manufacture films and foils. No. 2,085,532. Edw. Kinsella, Spondon, near Derby, England, to Celanese Corp. of America, corp. of Del.
Remotely controlled chemical compound formulator. No. 2,085,881. Harold S. Van Doren, Williston Park, N. Y.
Nitration apparatus. No. 2,085,924. Riewen Riegler, Buffalo, N. Y., to National Aniline & Chemical Co., Inc., New York City.
Method and apparatus for cleaning gases. No. 2,086,354. Morton I. Dorfan, Pittsburgh, Pa., to Blaw-Knox Co., Blawnox, Pa.
Apparatus for mixing oil and air. No 2,086,511. Wm. P. Reiboldt, Irvington, N. J., seventy-five per cent. to K. I. Clisby, Montclair, N. J.

Cellulose

Preparation cellulose ethers. No. 2,083,554. Louis H. Bock and Alva L. Houk to Rohm & Haas Co., all of Phila., Pa.
Recovery of a mixed organic acid ester of cellulose from its mixture with nitrocellulose. No. 2,083,667. Marvin J. Reid, Rochester, N. Y., to Eastman Kodak Co., Jersey City, N. J.
Manufacture sheeted cellulose fiber adapted for conversion into cellulose derivatives. No. 2,083,744. Geo. A. Richter to Brown Co., both of Berlin, N. H.
Preparation cellulose ether containing the group R-O-CH_2, wherein R is an organic radical containing more than 5 carbon atoms, substituted for the hydrogen of a cellulose hydroxyl group. No. 2,084,125. Louis H. Bock and Alva L. Houk, to Rohm & Haas Co., all of Phila., Pa.
Thin, transparent cellulose acetate sheet of the wrapping type, containing fine divided chalk. No. 2,084,313. Norman F. Beach, Rochester, N. Y., to Eastman Kodak Co., Jersey City, N. J.
Treatment alcohol-wet nitrocellulose for incorporation into alcohol-free compositions. No. 2,084,323. Emile C. DeStubner, New York City.
Manufacture highly acetylated cellulose acetates. No. 2,084,833. Ernst Berl, Darmstadt, Germany.
Preparation cellulose derivative spinning solution containing wax. No. 2,085,013. Camille Dreyfus, New York City, and Wm. Whitehead, Cumberland, Md., to Celanese Corp. of America, corp. of Del.
Preparation porous and insulating materials containing derivatives of cellulose. No. 2,085,047. Geo. Schneider, Montclair, N. J., to Celanese Corp. of America, corp. of Del.
Production sponge-like masses; saponifying a porous mass of a material containing a cellulose carboxylic ester. No. 2,085,052. Wm. Ivan Taylor, Spondon, near Derby, England, to Celanese Corp. of America, corp. of Del.
Cellulosic product; flat, lustrous veneer, facing produced from commercial veneer, retaining and exhibiting undisturbed fibre orientation and inherent pattern, having fibre structure in which natural pigmentation is replaced by artificial coloration throughout. No. 2,085,463. Russell Fortune, Indianapolis, Ind.
Watermarking pellicle of regenerated cellulose. No. 2,086,178. James E. Snyder, Kenmore, N. Y., to du Pont, Wilmington, Del.
Treatment cellulosic bodies; having deposited on the fibrous surfaces a polycyclic phenol. No. 2,086,418. James Karr Hunt and Geo. Henry Latham to du Pont, all of Wilmington, Del.
Treatment cellulosic bodies. No. 2,086,419. James Karr Hunt and Geo. Henry Latham to du Pont, all of Wilmington, Del.

Coal Tar Chemicals

Manufacture amino and nitro derivatives. No. 2,083,962. Pierre Petitcolas, Rouen, France, to Compagnie Nationale de Matieres Colorantes et Manufactures de Produits Chimiques du Nord Reunies, Etablissements Kuhlmann, Paris, France.
Production diazonium salts. No. 2,084,934. Gerald Bonhote and Adolf Wirz to Society of Chemical Industry in Basle, all of Basel, Switzerland.
Production halogenated anthraquinone compounds. No. 2,084,970. Wm. Dettwyler, Milwaukee, Wis., to du Pont, Wilmington, Del.
Preparation arsenobenzene-mono-sulfoxylates. No. 2,085,305. Alfred Fehrle, Bad Soden-in-Taunus, Karl Streitwolf, deceased, late of Frankfort-am-Main, by Frieda Streitwolf, Frankfort-am-Main, administratrix, and Paul Fritzsche, Frankfort-am-Main, Germany, to Winthrop Chemical Co., Inc., New York City.
Preparation ortho-aminazo compound. No. 2,085,315. Erwin Hoffa and Hans Heyna, Frankfort-am-Main, Germany, to General Aniline Works, Inc., New York City.

Patents digested include issues of the "Patent Gazette," June 15 through July 6 inclusive.

Preparation phenol; causing calcium hydroxide to react in an aqueous medium upon chlorobenzene. No. 2,085,429. Ernst Herdieckerhoff, Opladen, Germany, to I. G., Frankfort-am-Main, Germany.
Preparation monohalogenated unsaturated ketones containing a sterol nucleus. No. 2,085,474. Leopold Ruzicka, Zurich, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.
Treatment oxygen derivatives of hydrocarbons in which aliphatic hydrocarbons predominate. No. 2,085,500. Jos. Hidy James, Pittsburgh, Pa., to Clarence P. Byrnes, Trustee, Sewickley, Pa.
Preparation compounds of the triphenylmethane series. No. 2,085,736. Wm. S. Calcott and Paul W. Carleton, Penns Grove, and Edwin L. Mattison, Carneys Point, N. J., to du Pont, Wilmington, Del.
Improving bloom-imparting qualities of coal tar pitch capable of imparting green fluorescence to hydrocarbon oils. No. 2,085,759. Lycurgus Laskaris, Lansdowne, Pa., to Atlantic Refining Co., Phila., Pa.
Door for horizontal chamber ovens for production of gas and coke. No. 2,085,775. Paul Van Ackeren, Essen-am-Ruhr, Germany, to Koppers Co., Pittsburgh, Pa.
Production medium temperature coke. No. 2,085,903. Wilhelm Fitz, Essen, Germany, to Koppers Co., corp. of Del.
Treatment asphalt during manufacture by oxidation of cracked hydrocarbon residues. No. 2,085,992. Edwin F. Nelson to Universal Oil Products Co., both of Chicago, Ill.
Preparation chemically active artificial asphalts. No. 2,086,064. Johannes Benedict Carpzow, Bornsen, near Hamburg, Germany.
Manufacture 5,5-cyclohexenylalkylhydantoins. No. 2,086,311. August Binkert to Chemical Works, formerly Sandoz, both of Basel, Switzerland.
Method separating unsaturated and saturated aliphatic hydrocarbons. No. 2,086,473. Morris S. Nafash, Union City, N. J., to Cesare Barbieri, New York City.

Coatings

Vitrifiable coating composition. No. 2,085,124. Jos. J. Schaefer, Germantown, Pa., to Sharples Solvents Corp., Phila., Pa.
Apparatus for coating a surface with vitreous enamel. No. 2,085,278. Gordon L. Strubler, Chicago, Ill., to Corning Glass Works, Corning, N. Y.
Decorative coating process. No. 2,085,875. Geo. Sirovy, Cicero, Ill., to Century Vitreous Enamel Co., Chicago, Ill.
Coating casting machine. No. 2,086,117. Lynn B. Case, Highland Park, N. J., to John Waldron Corp., New Brunswick, N. J.
Coated electrode for arc welding. No. 2,086,132. Theophil E. Jerabek, East Cleveland, O., to Lincoln Electric Co., Cleveland, O.

Dyes, Stains, etc.

Preparation azo dyes. No. 2,083,619. Erik Schirm, Dessau in Anhalt, Germany, to General Aniline Works, Inc., New York City.
Production dyestuffs of the triarylmethane series. No. 2,083,888. Carl Winter and Paul Krebs, Ludwigshafen-am-Rhine, Germany, to General Aniline Works, Inc., New York City.
Diamino compounds. No. 2,083,890. Werner Zerweck and Ernst Korten, Frankfort-am-Main-Fechenheim, Germany, to General Aniline Works, Inc., New York City.
Production sulfur dyestuffs derived from indophenols. No. 2,083,891. Werner Zerweck, Frankfort-am-Main-Fechenheim, and Wilhelm Hechtenberg, Frankfort-am-Main, Germany, to General Aniline Works, Inc., New York City.
Apparatus for dyeing. No. 2,084,189. Murray N. Bulford, Pontiac, R. I., to B. B. & R. Knight Corp., corp of R. I.
Manufacture isatin—α—halides halogenated in the nucleus. No. 2,084,528. Eduard Kambli, to Society of Chemical Industry in Basle, both of Basel, Switzerland.
Preparation dyestuffs of the anthracene series. No. 2,084,641. Josef Haller, Leverkusen-Wiesdorf, Germany, to Durand and Huguenin A. G., Basel, Switzerland.
Production indigoid dyestuffs. No. 2,084,712. Ernst Stocklin, Binningen, near Basel, and Eduard Kambi, Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.
Production azo dyestuffs. No. 2,084,731. Joseph Gyr and Otto Kaiser, to Society of Chemical Industry in Basle, both of Basel, Switzerland.
Production azo compounds. No. 2,085,037. Fritz Mietzsch, Wuppertal-Barman, and Josef Klarer, Wuppertal-Elberfeld, Germany, to Winthrop Chemical Co., Inc., New York City.
Preparation vat dye compositions. No. 2,085,145. Paul Whittier Carleton, Penns Grove, N. J., and Arthur Lawrence Fox, Wilmington, Del., to du Pont, Wilmington, Del.
Method dyeing by treatment with a mordant bath comprising a colloidal suspension of hydrous ferric oxide, using natural vegetable dye. No. 2,085,795. Raymond L. Drew, Arlington, and Wallace S. Peck, Belleville, N. J., to American Dyewood Co., New York City.
Process for dyeing pelts, hairs, and feathers. No. 2,085,809. Erich Lehmann, Priorau, Kreis-Bitterfeld, Germany, to General Aniline Works, Inc., New York City.
Production disazo dyestuffs. No. 2,086,031. Karl Holzach and Bernd v. Bock, Ludwigshafen-am-Rhine, and Heinrich Ohlendorf and Erich Baumann, Dessau, Germany, to General Aniline Works, Inc., New York City.
Method dyeing elastic fabrics. No. 2,086,298. Augustin Isaac, Lyon, France, to Dognin, Societe Anonyme, Villeurbanne, France.
Manufacture mixed quinone dyestuffs. No. 2,086,337. Erik Schirm, Dessau, Germany, to General Aniline Works, Inc., New York City.

Explosives

Preparation nitrated hydroxy esters of pentaerythritol. No. 2,086,146. Jos. A. Wyler, Allentown, Pa., to Trojan Powder Co., corp. of New York.

Fine Chemicals

Manufacture sulfurized organic isocolloids. No. 2,083,549. Laszlo Auer, Budapest, Hungary, and Paul Stamberger, London, England, to J. Randolph Newman, Washington, D. C., as trustee.

Manufacture vulcanized isocolloids. No. 2,083,550. Laszlo Auer, Budapest, Hungary, to J. Randolph Newman, Washington, D. C., as trustee.

Antihalation backing for photographic films. No. 2,083,672. Merrill W. Seymour, Irondequoit, N. Y., to Eastman Kodak Co., Jersey City, N. J.

Light-sensitive silver salt print-out surface having design formed thereon with solution of a colored compound and a chemical restrainer. No. 2,083,675. Jos. C. Ville, Rochester, N. Y., to Eastman Kodak Co., Jersey City, N. J.

Sensitizing photographic emulsion. No. 2,083,804. Walter Zeh, Dessau in Anhalt, Germany, to Agfa Ansco Corp., Binghamton, N. Y.

Preparation hydroxy-chlorodiphenyl derivatives. No. 2,084,027. Morton Harris, Anniston, Ala., to Monsanto Chemical Co., St. Louis, Mo.

Preparation 4,4'dichloro-2-hydroxydiphenyl compound. No. 2,084,033. Russell L. Jenkins, Webster Groves, Mo., to Monsanto Chemical Co., St. Louis, Mo.

Preparation 4-aminodiphenyl compounds. No. 2,084,034. Russell L. Jenkins, Anniston, Ala., to Monsanto Chemical Co., St. Louis, Mo.

Preparation barbituric acid containing in the 5-positions a pyridine group. No. 2,084,136. Rudolf Gebauer, Dresden, Germany, to Chemische Fabrik von Heyden Aktiengesellschaft, Radebeul, near Dresden, Germany.

Preparation aryl mercuric salts of benzene carboxylic acids. No. 2,084,311. Carl N. Andersen, Watertown, Mass., to Lever Bros. Co., corp of Me.

Photographic material comprising a support and a silver halide emulsion sensitized layer. No. 2,084,436. Walter Dieterle, Dessau-Ziebigk in Anhalt, Germany, to Agfa Ansco Corp., Binghamton, N. Y.

Unsaturated alkylene amides and ureides of polyhydroxy aliphatic acids. No. 2,084,626. Donalee L. Tabern, Lake Bluff, Ill., to Abbott Labs., No. Chicago, Ill.

Preparation di-halogen substituted a-(p-hydroxyphenyl)-a-amino acetic acid hydrohalides of the same. No. 2,085,009. Otto Dalmar and John Niemann, Darmstadt, Germany, to Merck & Co., Inc., Rahway, N. J.

Production organic mercury compounds. No. 2,085,063. Carl N. Andersen, Watertown, Mass., to Lever Bros. Co., corp. of Me.

Manufacture aromatic mercury cyclic alkaloid compounds. No. 2,085,604. Carl N. Andersen, Watertown, Mass., to Lever Bros. Co., corp. of Me.

Preparation aromatic mercury substituted heterocyclic compound. No. 2,085,065. Carl N. Andersen, Watertown, Mass., to Lever Bros. Co., corp. of Me.

Manufacture aromatic mercury amides. No. 2,085,066. Carl N. Andersen, Wellesley Hills, Mass., to Lever Bros. Co., corp. of Me.

Synthetic preparation B (10)-hydroxycamphor. No. 2,085,476. Yoshikazu Sahashi, Meguro-ku, Kunijuro Takeuchi, Setagaya-ku, Tsuruzo Shimamoto, Yodobashi-ku, and Tsuneyasu Iki, Omori-ku, Tokyo, Japan, to Zaidan Hojin Rikagaku Kenkyujo, Tokyo, Japan.

Preparation heavy metal compounds of a thiobarbituric acid. No. 2,085,858. Heinrich Jung, Wuppertal-Vohwinkel and Hans Andersag, Wuppertal-Elberfeld, Germany, to Winthrop Chemical Co., Inc., New York City.

Preparation nitro compound of substituted benzotrifluorides. No. 2,086,029. Hans Heyna, Frankfort-am-Main-Hochst, Germany, to General Aniline Works, Inc., New York City.

Preparation halogen derivatives of a-methyl-butyl cresols. No. 2,086,336. Geo. W. Raiziss and Le Roy W. Clemence, Phila., Pa., to Abbott Labs., No. Chicago, Ill.

Glass and Ceramics

Process and apparatus for manufacture safety glass. No. 2,084,113. James H. Sherts, Tarentum, Pa., to Duplate Corp., corp. of Del.

Apparatus for producing laminate glass. No. 2,084,293. Wm. C. Bull, Brooklyn, N. Y.

Glass furnace charge, comprising silica, soda, and a lime component. No. 2,084,328. Howard P. Eells, Jr., Willoughby, and Harvey N. Barrett, Tiffin, O., to Non-Metallic Minerals, Inc., Cleveland, O.

Opaque lead glass of low melting point. No. 2,084,747. Jacob E. Rosenberg, Pittsburgh, Pa., to O. Hommel Co., corp. of Pa.

Apparatus for drawing tubing from a pool of glass. No. 2,085,245. Wm. J. Woods to Corning Glass Works, both of Corning, N. Y.

Method making glasses resistant to alkali metal vapors. No. 2,085,251. Robt. H. Dalton to Corning Glass Works, both of Corning, N. Y.

Frit kiln. No. 2,085,254. Jos. Wm. Emery, Cobridge, England.

Treatment alkali metal silicate glass to produce a clear solution. No. 2,086,230. Paul C. Lemmerman, Cleveland Heights, O., to du Pont, Wilmington, Del.

Synthetic resin magnifying glass. No. 2,086,286. Nathan M. Stanley, Dayton, O.

Splinterless glass; laminated—comprising at least one sheet of glass and a film comprising a polymer of a mixture of at least two unsaturated organic compounds. No. 2,086,506. Georg Kraenzlein, Frankfort-am-Main-Hochst, Germany, to I. G., Frankfort-am-Main, Germany.

Industrial and Heavy Chemicals

Preparation solid alkali sub-silicate. No. 2,083,545. Clarence W. Burkhart, Lansdowne, Pa., and Walter S. Riggs, Audubon, N. J., to Penn Salt Mfg. Co., Phila., Pa.

Preparation alkali metal hydroxide solutions. No. 2,083,648. Herbert Gorke, Leverkusen-I. G. Werk, Germany, to I. G., Frankfort-am-Main, Germany.

Production alkali metal peroxide. No. 2,083,691. Geo. Lewis Cunningham, Niagara Falls, N. Y., to Mathieson Alkali Works, Inc., New York City.

Separate recovery of potassium and ammonium phosphates. No. 2,083,652. Oskar Kaselitz, Berlin, Germany.

Production ferric chloride. No. 2,083,692. Kurt Wm. Freddy Dorph and Maurice C. Taylor, Niagara Falls, N. Y., to Mathieson Alkali Works, Inc., New York City.

Manufacture alcohols and esters, thermally decomposing hydrocarbons in presence of a vapor of a carboxylic acid containing at least 2 carbon atoms in the molecule. No. 2,083,693. Henry Dreyfus, London, England.

Production hydrogen by conversion of a gaseous hydrocarbon with a gas comprising an oxidizing agent of the group of steam, CO_2 and free oxygen. No. 2,083,795. Georg Schiller and Gustav Wietzel, Mannheim, Germany, to I. G., Frankfort-am-Main, Germany.

Manufacture hydrocyanic acid; reacting nitrogen compound with a hydrocarbon in presence of a catalyst body. No. 2,083,824. Harlan A. Bond and Chas. Roberts Harris, Niagara Falls, N. Y., to du Pont, Wilmington, Del.

Treatment concrete, etc. No. 2,083,863. Johan Philip Pfeiffer, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.

Preparation sodium hydrosulfite. No. 2,083,870. Norman D. Scott, Jos. Frederic Walker, and Virgil L. Hansley, Niagara Falls, N. Y., to du Pont, Wilmington, Del.

Dehydrogenation of alcohols. No. 2,083,877. Leo V. Steck, Piedmont, and Wm. Engs and Martin de Simo, Berkeley, Calif., to Shell Development Co., San Francisco, Calif.

Treatment gases containing sulfur compounds. No. 2,083,894. Gerald C. Connolly, Balto., Md., to Sulco Labs., Inc., New York City.

Catalytic process for conversion of sulfur compounds. No. 2,083,895. Gerald C. Connolly, Balto., Md., to Sulco Labs., Inc., New York City.

Method and apparatus for vaporizing sulfur and other fungicidal and insecticidal substances. No. 2,083,950. Emil Frederick Guba, Waltham, Mass.

Production sulfonates of tertiary alcohols. No. 2,084,253. Anton Hintermaier to Henkel & Cie, Gesellschaft mit beschrankter Haftung, both of Dusseldorf, Germany.

Manufacture a pressed, laminated, mica product containing mica flakes bonded together with the colloidal viscous resinous reaction product of at least one polyhydric alcohol and one boric acid compound. No. 2,084,262. Willis A. Boughton, Cambridge, and Wm. R. Mansfield, Boston, Mass., to New England Mica Co., Waltham, Mass.

Built-up mica product containing mica flakes, which are bonded in product with colloidal viscous resinous reaction product of a polyhydric alcohol and a phosphoric acid compound. No. 2,084,263. Willis A. Boughton, Cambridge, and Wm. R. Mansfield, Boston, Mass., to New England Mica Co., Waltham, Mass.

Production an acid halide of a dicarboxylic ether acid. No. 2,084,284. Norman D. Scott, Niagara Falls, N. Y., to du Pont, Wilmington, Del.

Manufacture aluminum chloride. No. 2,084,289. Almer McDuffie McAfee and Jos. A. Tryon, Port Arthur, Tex., to Gulf Oil Corp., Pittsburgh, Pa.

Manufacture aluminum chloride. No. 2,084,290. Almer McDuffie McAfee, Port Arthur, Tex., to Gulf Oil Corp., Pittsburgh, Pa.

Process of and apparatus for controlling catalytic and other contact mass reactions. No. 2,084,357. Thos. B. Prickett, Woodbury, N. J., to Houdry Process Corp., Dover, Del.

Manufacture hydration products of olefines. No. 2,084,390. Henry Dreyfus, London, England.

Polymerization process. No. 2,084,399. Glen M. Kuettel, Roselle, N. J., to du Pont, Wilmington, Del.

Production dense solid carbon dioxide in a mould. Nos. 2,084,402-3. Guido Maiuri, Aldwych, London, England, to Maiuri Refrigeration Patents, Ltd., London, England.

Method concentrating phosphate rock; treating phosphate bearing material with tetramethylammoniumhydroxide, a fatty acid, and fuel oil. No. 2,084,413. Herman B. Siems to Swift & Co. Fertilizer Works, both of Chicago, Ill.

Dehydrating continuously organic liquids which at beginning of process contain some water and do not chemically react with calcium sulfate. No. 2,084,419. Theodor Wallis, Dessau-Ziebigk, in Anhalt and Oskar Falek, Wiederitzsch, near Leipzig, Germany, to I. G., Frankfort-am-Main, Germany.

Production hydrogen catalysts; passing normally gaseous hydrocarbon and steam over a catalyst containing nickel, and a phosphate of magnesium. No. 2,084,511. James K. Small, Hudson View Gardens, N. Y., to Standard-I. G. Co.

Preparation hyposulfites; reacting an alkali metal and sulfur dioxide in an aqueous medium. No. 2,084,651. Werner Mecklenburg, Neunkirchen auf Rugen, Pommern, Germany, and Alfred Wurbs, Bokau, Czechoslovakia.

Process of and apparatus for performing thermal conversions. No. 2,084,691. Albert Francois Lebre, Paris, France.

Cyclic process for recovery of sulfur from sulfide ores. No. 2,084,697. Sibley Byron McCluskey, London, England.

Production alkyl chlorides from alkyl ethers; reacting a dialkyl ether with hydrogen chloride in presence of water. No. 2,084,710. Harold M. Spurlin to Hercules Powder Co., both of Wilmington, Del.

Process obtaining zinc oxide from mixture containing zinc and lead oxides, using zinc sulfide in process. No. 2,084,716. Werner von der Ohe, Beuthen, Germany, to Polensky und Zollner, Berlin, Germany.

Preservation green fodder, using sulfur dioxide in process. No. 2,084,797. Robt. G. Ferris to Starline, Inc., both of Harvard, Ill.

Purification tetrachloroethylene containing other chlorinated aliphatic hydrocarbons. No. 2,084,937. Edgar C. Britton, Gerald H. Coleman, and John W. Zemba to Dow Chemical Co., all of Midland, Mich.

Production ethyl alcohol from artichoke tubers. No. 2,085,003. Leo M. Christensen and Ellis I. Fulmer, Ames, Iowa, to Chemical Foundation, Inc., corp. of Del.

Acetylene generator. No. 2,085,084. Geo. M. Deming, East Orange, N. J. to Air Reduction Co., Inc., New York City.

Production colloidal metal hydroxides. No. 2,085,129. Fritz Stoewener, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Production alkali abietate compositions. Nos. 2,085,151-2. Edmund A. Georgi to Hercules Powder Co., both of Wilmington, Del.

Preparation partial oxidation products. No. 2,085,221. Jos. Hidy James, Pittsburgh, Pa., to Clarence P. Byrnes, trustee, Sewickley, Pa.

Manufacture ferric sulfate; treating with sulfur trioxide an anhydrous iron sulfate. No. 2,086,237. Robt. Pfanstiehl, Cleveland Heights, O., to du Pont, Wilmington, Del.

Preparation monohydric alcohols. No. 2,086,239. Anderson W. Ralston, Wm. O. Pool, and James Harwood, to Armour & Co., all of Chicago, Ill.

Alkali primary cell with depolarization by air having a plastic mass covering the electrode. No. 2,085,269. Rene Oppenheim to Societe Anonyme le Carbone, both of Gennevilliers, France.

Method increasing fermentative vigor of weakened butyl organisms. No. 2,085,428. Chas. T. Hanson, Balto., Md., to U. S. Industrial Alcohol Co., New York City.

Preparation high molecular weight sulfur compounds. No. 2,085,452. Paul L. Salzberg, Carrcroft, Del., to du Pont, Wilmington, Del.

Treating liquid partial oxidation products. No. 2,085,499. Jos. Hidy James, Pittsburgh, Pa., to Clarence P. Byrnes, Sewickley, Pa.

Resolution of suspensions of finely divided solids into substantially uniform solid fractions of varying average particle size. No. 2,085,538. Sanford C. Lyons, Bennington, Vt., to Bird Machine Co., Walpole, Mass.

Thermionic cathode containing an aluminate of a highly electron emissive alkaline earth metal. No. 2,085,605. Henry Thos. Ramsay and Harold Percy Rooksby, Middlesex, England, to General Electric Co., corp. of New York.

Manufacture denatured alcohol. No. 2,085,779. John C. Woodhouse to du Pont, both of Wilmington, Del.

Process purifying aminated compounds. No. 2,085,784. Robert Roger Bottoms to Girdler Corp., both of Louisville, Ky.

Manufacture alkylamines; reacting a lower alkanol with an ammonium halide in presence of added water and a halide of a metal having an atomic number between 24 and 29 as a catalyst. No. 2,085,785. Robt. Roger Bottoms to Girdler Corp., both of Louisville, Ky.

Separation lower alkylamines. Nos. 2,085,786-7. Robt. Roger Bottoms, Birmingham, Ala., to Girdler Corp., Louisville, Ky.

Paste electrolyte for electrolytic condensers, comprising ammonium bicarbonate, ammonium carbonate, boric acid, and a solvent. No. 2,085,958. Jesse T. Curtis, Cleveland, O.

Preparation alkali nitrate by reaction of nitric acid with alkali chloride in aqueous solution. No. 2,086,084. Paul Kubelka, Prague, Czechoslovakia.

Compositions of hydrogen peroxide and iron salts and method of stabilizing them. No. 2,086,123. Herschel I. Eisenman, East Orange, N. J.

Removal solvent from solvent-treated material. No. 2,086,180. Michele Bonotto to American Soya Products Corp., both of Evansville, Ind.

Apparatus for treatment soya beans, etc. No. 2,086,181. Michele Bonotto to American Soya Products Corp., both of Evansville, Ind.

Apparatus for production salt cake and hydrogen chloride. No. 2,086,206. Waldo Conkling Bailey, Shaker Heights, O., to du Pont, Wilmington, Del.

Method roasting metal sufide fines to produce sulfur dioxide. No. 2,086,232. Chas. A. MacDonald to General Chemical Co., both of New York City.

Regenerative absorption process for recovery of sulfur dioxide. No. 2,086,379. Arthur Maurice Clark, The Green, Norton-on-Tees, England, to Imperial Chemical Industries, Ltd., London, England.

Manufacture stable, solid, water-soluble aluminum acetate. No. 2,086,499. Theodor Hennig, Greiz, Germany, to Zschimmer & Schwarz Chemische Fabrik Dolau, Greiz-Dolau, Germany.

Process synthesizing hydrocyanic acid by the catalytic dehydration of formamide. No. 2,086,507. Alfred T. Larson to du Pont, both of Wilmington, Del.

Metals, Alloys, Ores

Art making cast iron castings, melting iron in presence of barium sulfate and barium sulfide. No. 2,083,562. Philip E. Harth and Malvin A. Baernstein to National Pigments & Chemical Co., all of St. Louis, Mo.

Heat treatment aluminum alloys. No. 2,083,576. Jos. A. Nock, Jr., Tarentum, Pa., to Aluminum Co. of America, Pittsburgh, Pa.

Desilverizing lead bullion; involving treatment of successive batches of bullion with zinc while molten to produce silver-zinc dross. No. 2,083,892. Fred. P. Clark to International Smelting & Refining Co., East Chicago, Ind.

Production copper powder; drawing copper wire with a fat and soap drawing compound, whereby sludge is formed, treating sludge with a non-corrosive solvent, and filtering. No. 2,084,154. Raymond P. Lutz, Oak Park, Ill., to Western Electric Co., Inc., New York City.

Method affixing a copper coating to a long length of ferrous metal. No. 2,084,268. Bert L. Quarnstrom to Bundy Tubing Co., both of Detroit, Mich.

Weld rod comprising composition containing tungsten, chromium, carbon, manganese, silicon, and iron. No. 2,084,275. Anthony G. de Golyer, New York City, to Vulcan Alloy Corp., corp. of Del.

Alloy steel containing chromium, nickel-like metal, and molybdenum-like metal. No. 20,421. Reissue. Peter Payson to Crucible Steel Co. of America, both of New York City.

Treatment copper slimes containing selenium and tellurium. No. 2,084,394. Max F. W. Heberlein, Rahway, N. J., to American Metal Co., Ltd., New York City.

Method and means for recovering gold. No. 2,084,487. Olaf Haraldson, Minot, N. Dak.

Treatment silicate ore containing silica and oxide of zirconium. No. 2,084,630. Camille Deguide, Aisemont-Lez-Fosses, Belgium, to Societe de Recherches et d'Applications Chimiques (Sorac), Societe Anonyme, Brussels, Belgium.

Metallurgical process and apparatus. No. 2,084,830. Enoch A. Barnard and Hugh J. Maguire, Anaconda, Mont., to Anaconda Copper Mining Co., New York City.

Metal refining. No. 2,084,978. Gilbert E. Sell, Cynwyd, Pa.

Anodic treatment of aluminum. No. 2,085,002. Robt. W. Buzzard, Kensington, Md.

Method chloridizing an ore material containing zinc oxide. No. 2,085,114. Thos. A. Mitchell to Hughes-Mitchell Processes, Inc., both of Denver, Colo.

Preparation a magnetic material composed of nickel, manganese, and iron. No. 2,085,118. Franz Noll, Berlin-Siemensstadt, Germany, to Siemens & Halske Aktiengesellschaft, Siemensstadt, near Berlin, Germany.

Quantitatively determining metal content of rhodium solutions. No. 2,085,177. Herbert E. Zschiegner, Ocean Grove, N. J., to Baker & Co., Inc., Newark, N. J.

Recovery of iron in a state of high surface area from a sludge containing reducible oxides of iron. No. 2,085,178. Marshall F. Acken, Woodbury, N. J., to du Pont, Wilmington, Del.

Copper base alloy composed of zinc, aluminum, manganese, and copper. No. 2,085,416. Michael George Corson to Union Carbide & Carbon Research Labs., Inc., both of New York City.

Process for coating cold rolled steel surface. No. 2,085,543. Floyd Francis Oplinger, Niagara Falls, N. Y., to du Pont, Wilmington, Del.

Acid and oxidation resistant physically homogeneous and easily workable copper alloy, consisting of copper, nickel, aluminum, and tin. No. 2,085,544. Wm. B. Price to Scoville Mfg. Co., both of Waterbury, Conn.

Method purifying molten iron containing manganese of sulfur and other inclusions. No. 2,085,565. Chas. W. Andrews to H. A. Brassert Co., both of Chicago, Ill.

Method brazing metal parts in an enveloping gaseous atmosphere containing water vapor, hydrogen, carbon dioxide and carbon monoxide. No. 2,085,587. Allen G. Hotchkiss to General Electric Co., both of Schenectady, N. Y.

Furnace for ore reduction. No. 2,085,625. Gustav Andersen, Copenhagen, Denmark.

Treatment aluminum and aluminum alloys. No. 2,085,697. John G. G. Frost and Walter Bonsack to National Smelting Co., all of Cleveland, O.

Process of and apparatus for recovery of noble metals from ore pulp. No. 2,085,711. Wm. Alfred Biesmann, Chicago, Ill., to Carl W. Johnson.

Addition agent; a cyanide-cadmium plating composition to which has been added an aldehyde. No. 2,085,747. John A. Henricks, Jr., Chicago, Ill., to du Pont, Wilmington, Del.

Aliphatic addition agents; a cyanide-cadmium plating composition containing a reaction product with an alkali metal cyanide of an aliphatic compound. No. 2,085,748. John A. Henricks, Jr., Chicago, Ill., to du Pont, Wilmington, Del.

Carbocyclic addition agents; a cyanide-cadmium plating composition containing a reaction product of an alkali metal cyanide with a carbocyclic compound. No. 2,085,749. John A. Henricks, Jr., Chicago, Ill., to du Pont, Wilmington, Del.

A cyanide-cadmium plating composition containing an amketaldoresin. No. 2,085,750. John A. Henricks, Jr., Chicago, Ill., to du Pont, Wilmington, Del.

Addition agents for nickel plating. No. 2,085,754. Richard O. Hull, Lakewood, O., to du Pont, Wilmington, Del.

A cyanide-cadmium plating composition containing an amine reaction product of a ketaldone. No. 2,085,776. John V. Vaughen, Lakewood, O., to du Pont, Wilmington, Del.

Treatment of metals. No. 2,085,802. Charles Hardy, Pelham Manor, N. Y., to Chas. Hardy, Inc., New York City.

Magnet material comprising magnetic particles bound together by vanadium pentoxide. No. 2,085,830. Samuel Ruben, New Rochelle, N. Y.

Method welding. No. 2,085,896. Worthy C. Bucknam, Mechanic Falls, Me., to Union Carbide & Carbon Corp., New York City.

Method of and apparatus for coloring aluminum articles. No. 2,085,988. Edwin M. McNally, Indianapolis, Ind.

Method and apparatus for roasting ores. No. 2,086,193. Chas. Forbes Silsby, White Plains, N. Y., to General Chemical Co., New York City.

Ore roasting; production sulfur dioxide and molten iron oxides. No. 2,086,201. Fred. C. Zeisberg to du Pont, both of Wilmington, Del.

Apparatus for electrodeposition of a smooth coating of metal. No. 2,086,226. Clayton M. Hoff, Lakewood, O., to du Pont, Wilmington, Del.

Welding electrode composed of cadmium, zirconium, and copper. No. 2,086,329. Franz R. Hensel and Earl I. Larsen to P. R. Mallory & Co., all of Indianapolis, Ind.

Recovery gold, silver, and rare metals from natural mineral water; using iron chloride, iron oxide, and ammonia in process. No. 2,086,384. Lorena C. Lady, Rogers, Ark., one-half to Elisha L. Lady, Hot Springs, Ark.

Naval Stores

Glow discharge treatment of rosin. No. 2,086,434. Lanning P. Rankin, Norton, Kans., to Hercules Powder Co., Wilmington, Del.

Paper and Pulp

Method modifying cellulose pulp for paper making purposes; using caustic soda in process. No. 2,083,575. Izador J. Novak, Bridgeport, Conn., and Albert L. Clapp, Danvers, Mass., to Raybestos-Manhattan, Inc., Bridgeport, Conn.

Manufacture paper-making furnish containing heat-reactive resins; using cresylic acid, formaldehyde, an alkaline catalyst in process; final product characterized by property of readily assimilating water and reduction thereby to a watery pump. No. 2,083,929. Earl P. Stevenson, Newton, and Howard J. Billings, So. Acton, Mass., to Richardson Co., Lockland, O.

Manufacture paper filled with an alkaline filler. No. 2,084,358. Harold Robert Rafton, Andover, Mass., to Raffold Process Corp., corp. of Mass.

Apparatus for paper dryness control. No. 2,085,128. Stephen A. Staege, Pittsburgh, Pa., to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Improved surface colored paper; impregnating same with an aqueous solution of an acetate of deacetylated chitin. No. 2,085,163. Herbert A. Lubs, Wilmington, Del., and John R. Roberts and Edwin R. Laughlin, Penns Grove, N. J., to du Pont, Wilmington, Del.

Improved wax coated papers; comprising sheet of paper impregnated with paraffin wax containing a condensation product of chlorinated paraffin and an aromatic hydrocarbon. No. 2,085,373. Clarence M. Loane, Whiting, and Bernard H. Shoemaker, Hammond, Ind., to Standard Oil Co., Chicago, Ill.

Flexible, impervious and weatherproof material. No. 2,085,473. Wm. Wallace Rowe, Cincinnati, O., to Paper Service Co., Lockland, O.

Safety paper having incorporated therein a mono-nitrogen substituted naphthylamine. No. 2,085,675. Francis L. Simons, Needham, Mass., to Geo. LaMonte & Son, Nutley, N. J.

Safety paper having incorporated therein a primary mono-amino diphenyl. No. 2,085,874. Francis L. Simons, Needham, Mass., to Geo. LaMonte & Son, Nutley, N. J.

Manufacture strip gum papers, applying non-adhesive waterproof material to gum coating. No. 2,086,126. John Stephen Gilchrist, Worcester, Mass., to McLaurin-Jones Co., Brookfield, Mass.

Petroleum Chemicals

Separation hydrocarbon oil-wax mixture into solid constituents. No. 2,083,547. Jos. A. Alexander to Atlantic Refining Co., both of Phila., Pa.

Propane dewaxing. No. 2,083,700. Henry O. Forrest, Teaneck, and Lee Van Horn, Elizabeth, N. J., to Standard Oil Co., Chicago, Ill.

Method and apparatus for electrically treating emulsions. No. 2,083,798. Claudius H. M. Roberts, Webster Groves, Mo., to Petroleum Rectifying Co. of Calif., Los Angeles, Calif.

Method and apparatus for electrically treating emulsions. No. 2,083,799. Claudius H. M. Roberts, Long Beach, Calif., to Petroleum Rectifying Co. of Calif., Los Angeles, Calif.

Method and apparatus for dehydrating petroleum. No. 2,083,801. Harold C. Eddy to Petroleum Rectifying Co., of Calif., both of Los Angeles, Calif.

Process and apparatus for treating emulsions. No. 2,083,802. Wm. Woelflin, Long Beach, Calif. to Petroleum Rectifying Co. of Calif., Los Angeles, Calif.

Purification organic oxy compounds. No. 2,083,856. Richard Z. Moravec, Berkeley, and Theo. Evans and Cecil Humphreys, Martinez, Calif., to Shell Development Co., San Francisco, Calif.

Production valuable synthetic resinous materials. No. 2,083,883. Hein Israel Waterman, Delft, Netherlands, to Shell Development Co., San Francisco, Calif.

Solvent refining mineral oil. No. 2,083,893. Louis A. Clarke, Fishkill, N. Y., to Texas Co., New York City.

Preparation 9-amino-3,6-dimethoxy-10-methyl-acridinium chlorides. No. 2,083,908. Sahachiro Hata, Konomu Matsumura, and Kiyoyuki Ishihara, Tokyo, Japan.

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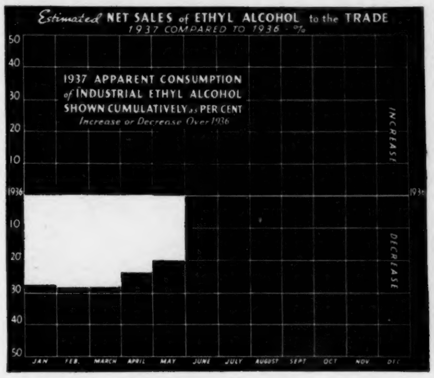


Apparent consumption of industrial ethyl alcohol from Jan. 1 to May 31, 1937, was 21,147,000 wine gallons. This is 19.8 per cent less than during the same period in 1936 when 26,346,000 wine gallons were consumed.

TEST PLASTICIZERS IN ETHYL CELLULOSE

Films of ethyl cellulose retain their toughness and flexibility even under conditions of severe aging when plasticized with dibutyl phthalate, it was demonstrated recently.

A long series of tests with eighteen commercial plasticizers brought out several other advantages of dibutyl phthalate. Among these were observations that it is a good solvent for ethyl cellulose, gives a high yield point and elongation to the film and works well in concentrations as low as 2 to 5 per cent. The authors also showed that plasticizers which yield the toughest ethyl cellulose compositions are characterized by a high hardness index (property of not detracting from film hardness).

The advantages of dibutyl phthalate as a plasticizer for other film-forming cellulose derivatives have long been known. Because of its water-white color, stability to light, lack of odor and non-toxic character, it is perhaps the best known and most widely used plasticizer in the lacquer industry. The U. S. Industrial Chemical Co. has supplied a superior grade for a number of years and is confident that this product will find a similar extensive use in ethyl cellulose compositions.

EXPECT NEW ADHESIVE TO AID LABEL PASTING

Development of an adhesive for fixing spot labels to tin, oily plate and lacquered or varnished surfaces—long trouble spots in labeling work—was announced recently.

The new product is expected to aid materially in overcoming crystallization and brittleness which, it is pointed out, frequently destroy permanent adhesion of labels, particularly in cold weather or in dry air. Another advantage claimed for this adhesive is protection against discoloration of labels and freedom from unpleasant odor.

While primarily developed for applying labels to metal containers, the new adhesive is asserted to be adaptable for holding labels to vitreous surfaces as well. The manufacturer adds that it can be used in hand or automatic machine labeling with coverage of better than 100,000 square inches per gallon.

FORESEE ALL-PLASTIC GLASS DEVELOPMENT WITHIN REACH

Rapid Progress In Manufacture Of Plastic Interlayers for Safety Glass Expected To Lead To Ultimate Goal

Will further advances in the development of safety glass lead to an early realization of the final and logical step in its evolution—an all plastic glass? Yes, if the present rate of progress in plastics manufacture continues, answers one eminent authority after a survey of the field.

Thirty years ago, when the safety glass industry came into being with issuance of the first United States patent for laminated glass, this prediction would have been looked upon as a little short of visionary if not virtually impossible. Now it is conceded that the automotive industry may not have long to wait for its plastic windshield—safe in every sense of the word because it will be a surface less likely to break bones under forceful impact in accidents.

Few Obstacles Remain

The principal obstacle remaining before plastic glass is widely adopted is chiefly one of greater abrasion resistance, experts declare. Stability of plastics to light, moisture and heat has been greatly improved and is not the drawback it was years ago, specifications for current plastics reveal.

Most safety glass now manufactured is in reality little more than a sandwich of two sheets of glass with an interlayer of plasticized cellulose acetate. It is largely compacted or bonded by first giving it a preliminary pressing, after which it is immersed in a liquid bath where pressure is applied to the fluid, which in turn transmits it evenly to the sandwich effecting a final union. This process is reported to eliminate the possibility of breakage or exudation of the plastic along the edges of the glass—two difficulties experi-

(Continued on next page)

INCREASE ADHESION OF RUBBER LACQUERS WITH NEW EMULSIONS

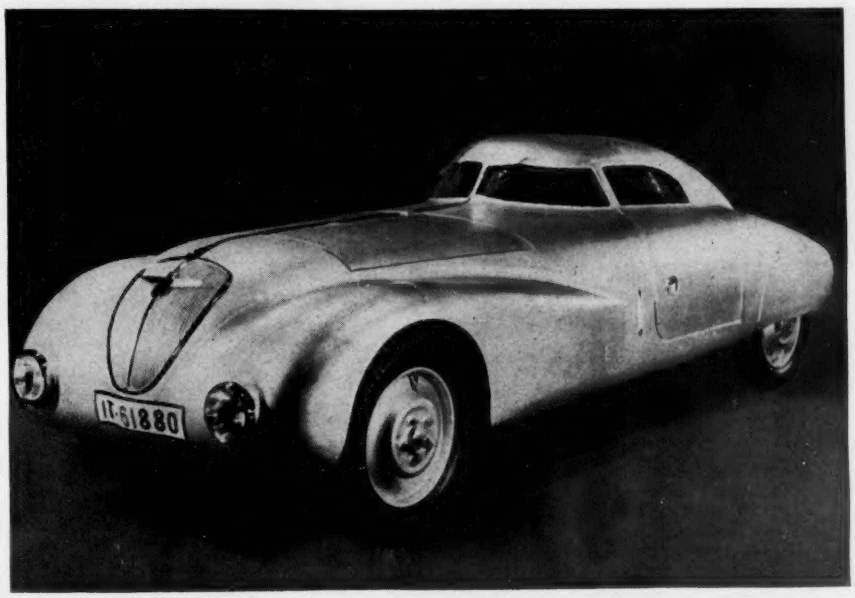
Adhesion of quick-drying lacquers to vulcanized or unvulcanized rubber surfaces may be improved by first applying to the rubber an aqueous emulsion of rubber, as for example latex, and one or more polymerized unsaturated materials such as ethyl methacrylate, vinyl acetate and similar compounds, a recent patent announces.

The process, which has been used in Germany and is now patented in this country, is said to be applicable to rubberized fabrics, rubber balls, gloves, shoes, etc. According to the statement of the inventor, the aqueous emulsions applied by dipping, brushing or spraying provide a film which has the property of adhering firmly to the rubber on one side and to any suitable lacquer on the other.

The proportions of latex and polymeric material may be varied to obtain a wide variety of finishes, it is stated.

A foam inhibitor for glue, casein, shellac, etc.; a special thermometer; a substitute for carnauba wax; four new-type rubber cements and other interesting technical specialties are described in the "Technical Developments" column on the next page. For further information, write to U. S. I.

Plastic Glass in Germany



The "Adler" sport car, shown above, illustrates how plastic glass has already been adapted to automobiles in Germany. Plexiglass, an acrylic resin which can be bent and formed with moderate heat, was used. This same material is said to have been employed in laminated glass manufacture.

MAY USE ALCOHOL AS BASE FOR PLASTICS

The possibility that alcohol might play an even greater role in plastics manufacture of the future was discussed recently at length before the Plastics Group of the British Society of Chemical Industry.

Alcohol, it was explained, furnishes a convenient source of acetaldehyde, a base from which various plastics may be obtained. Likewise, ethylene and ethylene oxide, closely associated with alcohol, are bases for other plastics. Ethylene was taken as a typical example which, if combined with benzene in the presence of aluminum chloride, might be used in the production of styrene. Polystyrene, made from styrene, has been reported to be the equal of fused quartz so far as dielectric strength is concerned.

ALL-PLASTIC GLASS DEVELOPMENT NEAR

(Continued from previous page)

enced under old manufacturing methods.

It is said that until about three years ago cellulose nitrate was practically the only plastic used for an interlayer in spite of its reported defects of discoloration and of brittleness at low temperatures. Around 1933, the industry largely adopted cellulose acetate because this material permitted a more intimate contact between it and the glass and consequently molded easier. In addition, it was said to be more resistant to ultraviolet rays and discoloration, although somewhat brittle at low temperatures.

Search Is Continuing

Search for more effective plastics is continuing and in itself may lead to the final objective: plastic glass. Up to the present time at least a score of other plastic materials or resins, ranging from ethyl cellulose to bleached crepe rubber, have been tried or held in abeyance until large scale commercial manufacture reduces costs.

The introduction of high boiling solvent plasticizers in the plastic interlayer is generally conceded to be a milestone in laminated glass history. Before their use, low boiling solvents were used to soften the plastic with the result that bubbles and separations developed upon volatilization of the solvent. In addition, the plastic lost much of its plasticity upon aging.

Diethyl and dimethyl phthalates, such as manufactured by the U. S. Industrial Chemical Co., Inc., are among the plasticizers which have been widely adopted by the industry because of their stability to light and heat. Both products, besides possessing good solvency for cellulose acetate, have a high retentivity value and are colorless.

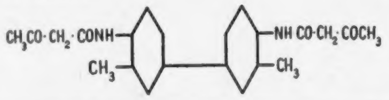
In some cases where the plastic interlayer is not in itself adhesive to the glass, an extra adhesive must be used to insure a complete bond. However, it is asserted that the ideal plastic interlayer should combine adherence to the glass in addition to its other properties.

Unusual Intermediate Improves Azo Colors

An unusual dyestuff intermediate, an arylamide of the acetoacetic ester, $CH_3CO.CH_2.CO.CONHAr$, may be the means of improving domestic production of azo colors.

The compound, bisacetoacet-o-tolidide, which has been prepared by the U. S. Industrial Chemical Co., Inc., has been found to yield azo coloring compounds which do not form salts with weak caustic alkalies. This property is said to be an advantage over other intermediates with reactive methylene groups.

The formula of bisacetoacet-o-tolidide is as follows:



Dye Production Hits New High

Domestic production of coal-tar dyes hit a record high during 1936 when 119,233,551 lb. were produced, according to data compiled by the Tariff Commission. It is significant that, of this total, 15,164,622 lb. were new and unclassified dyes. World Trade Notes also reports that synthetic indigo production increased 32 per cent and sulphur black 21 per cent over 1935.

Cellulose acetate compounded with an excessive amount of plasticizing agent has been suggested to replace gutta percha as a cover for golf balls.

TECHNICAL DEVELOPMENTS

To inhibit foaming in the manufacture of glue, casein, shellac, etc., a new product on the market will not interfere with other properties, according to the producer. It is also claimed, moreover, that the material eliminates specks, pinholes, etc., in finished goods. **(No. 1)**

U S I

The temperature of a liquid at any level in storage tank or tank car can be accurately determined both quickly and simply according to a trade report of a special type thermometer. The device employs an armored thermometer with the bulb protruding into an insulated sampling chamber. **(No. 2)**

U S I

Hard, synthetic wax, made especially for manufacturers of wax emulsions, is reported to be a substitute for more expensive carnauba wax. The producer claims that the wax makes a light-color emulsion, dries with a good sheen and takes an exceptionally fine polish. **(No. 3)**

U S I

An all-glass stirrer which permits stirring under vacuum or pressure without mercury seal, has been announced. The manufacturer reports that the fit between the glass shaft and tube is so precise, pressures over 60 mm of mercury may be used. **(No. 4)**

U S I

Four new-type rubber cements recently introduced can be applied without vulcanizing on such materials as rubber, glass, metal, tile, fabric, wood, leather, paper and burlap for use under wide temperature fluctuations, according to the manufacturer. The adhesives differ from one another in drying speed and color. **(No. 5)**

U S I

Accurate, smooth coatings are said to be developed at high speeds by a new coating machine for lacquers, rubber solutions, metallic coatings and lacquer emulsions. Metering rolls are used only to control the weight of coating and a separate furnisher roll is used. **(No. 6)**

U S I

A new resin sealer and preservative is said to prevent grain-raising and, by priming and sealing the surface, make possible a minimum of coats and hand sanding. The manufacturer claims that it adheres to canvas, paper, fabrics, metal, brick and cement. **(No. 7)**

U S I

A rubbing compound which will not leave white or gray deposits in routings or corners, has been reported. The compound is said to cut rapidly and effectively and to match the finish after drying. **(No. 8)**

U S I

Surface-hardening material for making cast iron and steel surfaces resistant to wear, corrosion and heat is now available in paste form. The manufacturer also claims that steel parts can be forged, formed or heat-treated after application without affecting surface hardness. It is spread on, allowed to dry and then sweated in with a gas torch. **(No. 9)**

U S I

Explosion-proof lighting fixtures with many new features were announced recently. The 200-watt, enclosing globe type fixtures are designed especially for atmospheres containing gasoline, naptha, alcohol, acetone and similar vapors, according to the manufacturer. **(No. 10)**

For further information write to U.S.I.

Process sweetening petroleum distillates, contacting gasoline with a catalyst consisting of calcined magnesium oxide in presence of an oxidizing agent. No. 2,083,917. John M. McGee, Casper, Wyo., to Standard Oil Co., Chicago, Ill.

Method polymerizing olefin hydrocarbons. No. 2,084,082. Louis H. Fitch, Jr., Bartlesville, Okla., First National Bank in Bartlesville, administrator of said Louis H. Fitch, Jr., deceased, to Phillips Petroleum Co., corp. of Delaware.

Recovery light oil from coke oven gas. No. 2,084,223. Hobart W. Seyler, Elizabeth, and Joseph H. Wells, Clairton, Pa.

Lubricating oil. No. 2,084,270. Bernard H. Shoemaker, Hammond, Ind., to Standard Oil Co., corp. of Ind.

Apparatus for heating hydrocarbon fluids. No. 2,084,277. Wright W. Gary, Great Neck, N. Y., to Gasoline Products Co., Inc., Newark, N. J.

Method vaporizing liquefied petroleum gas. No. 2,084,297. James Woodward Martin to Lone Star Gas Co., both of Dallas, Tex.

Conversion and coking of hydrocarbon oils. No. 2,084,304. Jos. G. Alther to Universal Oil Products Co., both of Chicago, Ill.

Furnace for heating hydrocarbon oils to conversion temperatures. No. 2,084,307. Marion W. Barnes to Universal Oil Products Co., both of Chicago, Ill.

Treatment hydrocarbon oils. No. 2,084,342. Willard F. Houghton, Swarthmore, Pa., to Atlantic Refining Co., Phila., Pa.

Lubricating oil. No. 2,084,352. Leo Liberthson, New York City, to Standard Oil Development Co.

Process for oxidation of polynuclear aromatic hydrocarbons. No. 2,084,382. Leo P. Chebotar, New York City, and Roger N. Wallach, Briarcliff Manor, N. Y., said Wallach to Chebotar.

Treatment lubricating oils with selective solvents. No. 2,084,471. James M. Whiteley, Jr., Roselle, N. J., to Standard Oil Development Co., corp. of Del.

Lubricating and insulating compound, comprising an organic ester of an inorganic acid and an oxidation inhibitor. No. 2,084,472. Peter J. Wiezevich, Elizabeth, N. J., to Standard Oil Development Co., corp. of Del.

Retort for distillation of carbonaceous materials. No. 2,084,491. Hastings John Holford, Southampton, England.

Valuable hydrocarbon products; composition comprising an unpolymerized hydrocarbon product and an iso-olefinic hydrocarbon polymer. No. 2,084,501. Michael Otto and Martin Mueller-Cunradi, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Process for decolorizing and imparting bloom to lubricating oils. No. 2,084,510. Jere C. Showalter, Goose Creek, Tex., to Standard Oil Development Co., corp. of Del.

Low pour point lubricant, comprising blend of two petroleum lubricating oils. No. 2,084,512. Chas. C. Swoope, Bayonne, and Martin M. Sadlon, Roselle Park, N. J., to Standard Oil Development Co., corp. of Del.

Process refining gasoline containing mercaptans. No. 2,084,575. Chas. A. Day, Jr., Long Beach, Calif., to Richfield Oil Corp., Los Angeles, Calif.

Process and product for stabilizing unsaturated hydrocarbons. No. 2,084,754. Chas. P. Wilson, Jr., Houston, Tex.

Compression fluorinated hydrocarbons. No. 2,084,950. Frederick Baxter Downing, Carneys Point, N. J., and Anthony Francis Benning, Penns Grove, N. J., to du Pont, Wilmington, Del.

Continuous process for manufacturing grease. No. 2,084,974. Gus Kaufman, Beacon, N. Y., to Texas Co., New York City.

Motor fuel comprising cracked hydrocarbon distillates of the character of gasoline. No. 2,084,977. Thos. H. Rogers and Vanderveer Voorhees, Hammond, Ind., to Gasoline Antioxidant Co., Wilmington, Del.

Production low boiling hydrocarbons. No. 2,085,027. Wm. O. Keeling, Independence, Mo.

Inhibitors for lubricating oils. No. 2,085,045. Raphael Rosen, Cranford, N. J., to Standard Oil Development Co., corp. of Del.

Gas fuel mixing device. No. 2,085,243. Ferdinand G. Welke to Shell Development Co., both of San Francisco, Calif.

Amplified distillation. No. 2,085,287. James R. Bailey, Austin, Tex., to Union Oil Co. of Calif., Los Angeles, Calif.

Processes for breaking petroleum emulsions of the water-in-oil type. Nos. 2,085,298-9. Melvin De Groote, St. Louis, and Arthur F. Wirtel, Kirkwood, Mo., to Tretolite Co., Webster Groves, Mo.

Method of distilling oils. No. 2,085,422. Fred L. Fast, Woodbury, N. J., to Socony-Vacuum Oil Co., Inc., New York City.

Preparation easy flowing mud flush from a clay normally producing an excessively viscous water suspension. No. 2,085,517. Pieter van Campen, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.

Refining mineral oil. No. 2,085,518. Willem J. D. van Dijck, The Hague, Netherlands, to Shell Development Co., San Francisco, Calif.

Dewaxing hydrocarbon oils. No. 2,085,519. Cedric Gerard Verver, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.

Continuous dewaxing process and apparatus. No. 2,085,521. Alvin Pierce Anderson, Wood River, Ill., and Chever M. Kellogg, University City, Mo., to Shell Development Co., San Francisco, Calif.

Apparatus for fractional distillation. No. 2,085,522. Gerrit Baars, The Hague, Netherlands to Shell Development Co., San Francisco, Calif.

Sweetening process. No. 2,085,523. Arnold Belchetz, Houston, Tex., and Bernard Richard Carney, Hartsdale, N. Y., to Shell Development Co., San Francisco, Calif.

Polymerization of olefines. No. 2,085,524. Martin de Simo and Frederick B. Hilmer, Berkeley, Calif., to Shell Development Co., San Francisco, Calif.

Process for stabilizing polymers. No. 2,085,525. Martin de Simo and Fred B. Hilmer, Berkeley, Calif., to Shell Development Co., San Francisco, Calif.

Treatment mineral oils. No. 2,085,527. Spafford Munroe Gregory, Long Beach, Calif., to Shell Development Co., San Francisco, Calif.

Manufacture lubricating grease; mixing a hydrocarbon oil with a metallic soap of a fatty acid, finally incorporating non-dehydrated rubber latex into grease. No. 2,085,533. Edwin N. Klemgard, Martinez, Calif., to Shell Development Co., San Francisco, Calif.

Polymerization of unsaturated hydrocarbons. No. 2,085,535. Siegfried Leonard Langedijk and Adrianus Johannes van Peski, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.

Refining a highly paraffinic lubricating oil by treating same with sulfuric acid. No. 2,085,545. Edmond R. P. E. Retailliau, Wood River, Ill., to Shell Development Co., San Francisco, Calif.

Distillation process. No. 2,085,546. Petrus Jurjen Roelfsema, Walnut Creek, Calif., to Shell Development Co., San Francisco, Calif.

Manufacture from crude oil, motor fuel having a high anti-knock rating. No. 2,085,623. Malcolm P. Youker to Phillips Petroleum Co., both of Bartlesville, Okla.

Treatment hydrocarbon oils. No. 2,085,938. Jos. G. Alther to Universal Oil Products Co., both of Chicago, Ill.

Conversion and coking of hydrocarbon oils. No. 2,085,939. Jos. G. Alther to Universal Oil Products Co., both of Chicago, Ill.

Apparatus for testing oil well formations by pumping. No. 2,085,972. Erle P. Halliburton, Los Angeles, Calif., to Halliburton Oil Well Cementing Co., Duncan, Okla.

Conversion hydrocarbon oils. No. 2,086,004. Kenneth Swartwood to Universal Oil Products Co., both of Chicago, Ill.

Conversion halogenated epoxides to valuable hydroxy compounds. No. 2,086,077. Herbert P. A. Groll, Oakland, and Geo. Hearne, Berkeley, Calif., to Shell Development Co., San Francisco, Calif.

Solvent extraction petroleum oils. No. 2,086,168. David R. Merrill, Long Beach, Calif., to Union Oil Co. of Calif., Los Angeles, Calif.

Processes for breaking petroleum emulsions of the water-in-oil type. Nos. 2,086,215-6-7. Melvin De Groote, St. Louis, Mo., to Tret-O-Lite Co., Webster Groves, Mo.

Method increasing anti-knock quality of motor fuel. No. 2,086,287. Chas. C. Towne, Beacon, N. Y., to Texas Co., New York City.

Process reconditioning a mineral oil precipitate of sprayed coating material. No. 2,086,367. Seymour G. Saunders, Birmingham, Ala., and Harry Morrison, Detroit, Mich., to Chrysler Corp., Highland Park, Mich.

Lubricating oil. No. 2,086,399. Chas. C. Towne, Beacon, N. Y., to Texas Co., New York City.

Solvent refining oil. No. 2,086,484. Chas. C. Towne, Beacon, N. Y., to Texas Co., New York City.

Solvent extraction. No. 2,086,487. Wm. H. Bahlke and Fred W. Sullivan, Jr., Hammond, Ind., and Robert E. Wilson, Chicago, Ill., to Standard Oil Co., Chicago, Ill.

Conversion hydrocarbon oils. No. 2,086,490. Luis de Florez, Pomfret, Conn., and James W. Gray, Port Arthur, Tex., to Texas Co., New York City.

Pigments, Dry Colors and Fillers

Manufacture variably colored titanium pigment composition containing lead titanate and iron oxide. No. 2,084,826. Lonnie W. Ryan, Westfield, and Winfred J. Cauwenberg, Elizabeth, N. J., to National Lead Co., New York City.

Method separating a calcined titanium dioxide pigment into particles of different sizes; using acid-reacting salt in process. No. 2,084,917. Walter K. Nelson, Brooklyn, N. Y., to Natonal Lead Co., New York City.

Production alcoholic dispersions of titanium pigments; mixing a finely divided titanium pigment in an aliphatic alcohol in mixture with an acid-reacting salt. No. 2,084,918. Walter K. Nelson, Metuchen, N. J., to National Lead Co., New York City.

Production titanium pigments. No. 2,085,165. Reginald Hill Monk, Rosemere, Que., to American Zinc, Lead & Smelting Co., St. Louis, Mo.

Manufacture color master materials containing an organic derivative of cellulose and a pigment. No. 2,085,512. Geo. Schneider, Montclair, N. J., to Celanese Corp. of America, corp. of Del.

Manufacture color master material containing a pigment and a plasticized nitrocellulose. No. 2,085,528. Ernst Alex. Grenquist, Bloomfield, N. J., to Celluloid Corp., corp. of N. J.

Resins, Plastics, etc.

Manufacture vinyl derivative articles. No. 2,083,628. Georges E. Zelger, Montreuil sous Bois, France, to Eastman Kodak Co., Jersey City, N. J.

Floating die head for molding presses. No. 2,083,676. Leroy W. Vinal, Leominster, Mass., to du Pont, Wilmington, Del.

Resinous product obtainable by resinifying with formaldehyde the reaction product of a 1-mercapto aryl thiazole, formaldehyde, and an ammonium sulfide. No. 2,084,011. Jan Teppema, Boston, Mass., to Wingfoot Corp., Wilmington, Del.

Pyrolysis of hydrocarbons for resin manufacture. No. 2,084,012. Chas. A. Thomas, Dayton, O.

Manufacture a decorative laminated product. No. 2,084,081. Herbert A. Faber, to Formica Insulation Co., both of Cincinnati, O.

Production a resinous body; mixing glycerin with a liquid partial condensate of phenol and formaldehyde, adding mixture to melted colophony, and heating. No. 2,084,203. Earl C. Kneale and Henry H. Wohlgemuth, Pontiac, Mich.

Resinous and wax-like reaction products from polyhydric alcohols and boric acid compounds. No. 2,084,261. Willis A. Boughton, Cambridge, and Wm. R. Mansfield, Boston, Mass., to New England Mica Co., Waltham, Mass.

Plastic composition; highly absorptive vehicle for liquids. No. 2,084,-272. Alex J. Auchterlonie, Grosse Pointe, Mich.

Preparation urea resin, mixing a urea with an aldehyde in presence of a nitrogenous compound. No. 2,084,314. Howard L. Bender and Harry A. Hoffman, Bloomfield, N. J., to Bakelite Corp., New York City.

Method seasoning thermoplastic materials containing an organic substitution derivative of cellulose and residual solvent. No. 2,084,372. Bjorn Andersen, Maplewood, and Ernst A. Grenquist, Bloomfield, N. J., to Celluloid Corp., corp. of N. J.

Plastic and coating compositions; comprising polymerized methyl alpha methacrylate and a plasticizer therefor. No. 2,084,386. John Wm. Croom Crawford, Ardrossan, Scotland, to Imperial Chemical Industries, Ltd., corp. of Great Britain.

Production surface ornamentation on a piece of heat-hardened phenol formaldehyde resin, by immersing same in potassium hydroxide solution. No. 2,084,393. Warren R. Hanson, Arlington, N. J., to du Pont, Wilmington, Del.

Manufacture resinous materials by polymerization of methyl methacrylate. No. 2,084,415. Daniel E. Strain to du Pont, both of Wilmington, Del.

Luminous plastic substance; transparent formaldehyde-urea base. No. 2,084,526. Jos. Pierre Grenier to Societe Francaise Helita, both of Paris, France.

Solid, hard, brittle synthetic resin comprising a non-gelled condensation product of propylene chloride and benzene in presence of a condensation catalyst. No. 2,084,927. Chas. C. Towne, Poughkeepsie, N. Y., to Texas Co., New York City.

Vinyl ester resins, reacting together an aldehyde and a partial hydrolysis product of a polyvinyl ester in presence of an acid catalyst. No. 20,430. Reissue. Geo. O. Morrison, Shawinigan Falls, Que., Canada, Fred W. Skirrow, Purley, England, and Kenneth G. Blaikie, Shawinigan Falls, Que., Canada, to Canadian Electro Products Co., Ltd., Montreal, Que., Canada.

Apparatus for kneading and working plastic material. No. 2,084,983. Robt. Wm. Bailey, Phila., Pa.

Synthetic resin, comprising condensation product of phenol phthalein and castor oil. No. 2,085,183. Edmond H. Bucy and Robt. Watkins, Waukegan, Ill., to Atlas Powder Co., No. Chicago, Ill.

Manufacture urea resin products. No. 2,085,492. Carleton Ellis, Montclair, N. J., to Plaskon Co., Inc., corp. of Del.

Alkyd resin compositions comprising rubber hydrochloride and an alkyd resin. No. 2,085,778. Herbert A. Winkelmann, Chicago, Ill., to Marbon Corp., corp of Del.

Apparatus for extrusion of materials in plastic state. No. 2,085,978. Harry Hill, Sydney Beckinsale, Abbey Wood, London, Walter French Slater, Lewisham, London, and Percy Dunsheath, Sidcup, Kent, England, to Henley Extrusion Machine Co., Ltd., London, England.

Polymerization acrylic esters and mixtures of acrylic esters with vinyl esters. No. 2,086,093. Hermann Plauson, Darmstadt, Germany, to Rohm & Haas Co., Phila., Pa.

Process surface strengthening compound lumber by application of a suspensoid colloid dispersion of fusible heat hardenable resin in a nonsolvent. No. 2,086,187. Arthur J. Norton to General Plastics, Inc., both of No. Tonawanda, N. Y.

Manufacture polyhydric alcohol-polybasic acid resins. No. 2,086,458. Roger Adams, Urbana, Ill., to du Pont, Wilmington, Del.

Multicolored plastic article. No. 2,086,493. Finley F. Ellingwood, Metuchen, N. J., to Bakelite Corp., New York City.

Rubber

Vulcanizable rubber composition containing a vulcanization agent and accelerator, comprising reaction product of a dithiophosphate and a chlorine compound of sulfur. No. 20,411. Reissue. Chas. J. Romieux, Summit, and Kenneth D. Ashley, Cranford, N. J., to American Cyanamid Co., New York City.

Vulcanized rubber composition, treating finely divided clay with a neutral and solid compound of an ethanolamine with a higher fatty acid, and mixing with rubber. No. 2,083,998. Geo. D. Kratz, Scarsdale, N. Y., and Wharton Jackson, New York City, to Kaolin Processes, Inc., Elizabeth, N. J.

Treatment rubber; vulcanizing same in presence of phenyaclylidene di (dimethyl dithiocarbamate). No. 2,084,038. Joy G. Lichty, Stow, O., to Wingfoot Corp., Wilmington, Del.

Rubber derivatives; treatment rubber with halide of an amphoteric metal. No. 2,084,402. Thos. C. Morris, Akron, O., to Wingfoot Corp., Wilmington, Del.

Condensation derivatives of rubber prepared by action on rubber of either a halide of an amphoteric metal or chlorostannic acid. No. 2,084,-043. Thos. C. Morris, Akron, O., to Wingfoot Corp., Wilmington, Del.

Vulcanized rubber product possessing improved age-resisting properties. No. 2,084,131. Albert M. Clifford, Stow, O., to Wingfoot Corp., Wilmington, Del.

Colored rubber products; mixing rubber product with a water-insoluble mono-azo dyestuff. No. 2,084,555. Ernst Fischer, Frankfort-am-Main, Germany, to General Aniline Works, Inc., New York City.

Manufacture extruded rubber articles from aqueous dispersions of rubber. No. 2,084,702. Ugo Pestalozza, Milan, Italy.

Rubber composition matrix having embedded therein but exposed upon the surface granular abrasive matter, each granule having a metal coat plated thereto and vulcanized to the rubber. No. 2,084,784. Rodolphe Stahl, Detroit, Mich.

Method vulcanizing rubber by heating rubber with sulfur and carbethoxybenzthiazylsulfide. No. 2,085,401. Douglas Frank Twiss, Wylde Green, Sutton Coldfield, and Fred. Arthur Jones, Birmingham, England, to Dunlop Tire and Rubber Corp., Buffalo, N. Y.

Manufacture rubber articles. No. 2,085,859. Walter Kay, Bury, England, to Kaysam Corp. of America, Dover, Del.

Production vulcanized rubber articles; treating rubber with a vulcanizing agent and an azine sulfide vulcanization accelerator. No. 2,086,-186. Wm. E. Messer, Cheshire, Conn., to U. S. Rubber Corp., New York City.

Manufacture expanded rubber. No. 2,086,513. Dudley Roberts, New York City, Thos. A. Scott, Balto., Md., and Fred W. Peel, Yonkers, N. Y., to Rubatex Products, Inc., corp. of Del.

Textile, Rayon

Lubrication artificial filaments. No. 2,083,635. Cyrus O. Butler and Edgar C. Guenther, Kingsport, Tenn., to Eastman Kodak Co., Jersey City, N. J.

Manufacture artificial materials. No. 2,083,694. Henry Dreyfus, London, England.

Yarn and filament twisting device. No. 2,083,724. Geo. Dewey Major, Cumberland, Md., to Celanese Corp. of America, corp. of Del.

Method treating natural and artificial yarns. No. 20,417. Reissue. John Marshall Hood, So. Hadley, Mass.

Production artificial filaments, etc., having a reduced luster due to presence therein of a finely divided pigment consisting of barium sulfate. No. 2,084,389. Henry Dreyfus, London, England.

Method delustering textiles containing yarns of organic derivatives of cellulose; subjecting same to action of a hot aqueous delustering bath. No. 2,084,410. Herbert Platt, Cumberland, Md., to Celanese Corp. of America, corp. of Del.

Manufacture textiles; spinning material containing secreted fibres, consisting in oiling material by means of a product containing a decoction of malvaceous plants, and spinning oiled mass. No. 2,084,516. Julien Van Puymbroeck, Brussels, Belgium.

Production artificial silk threads having uniform physical and dyeing characteristics. No. 2,084,916. Jan Willem Lubberhuizen, Arnhem, Netherlands, to American Enka Corp., Enka, N. C.

Apparatus for applying lubricants to yarn. No. 2,084,960. Jos. B. Johnson and Leslie L. Cobb, Kingsport, Tenn., to Eastman Kodak Co., Rochester, N. Y.

Production artificial products having basis of organic derivatives of cellulose, containing wax-like higher fatty acid esters of polyhydric alcohols. No. 2,085,014. Camille Dreyfus, New York City, and Wm. Whitehead, Cumberland, Md., to Celanese Corp., of America, corp. of Del.

Preparation artificial threads; spinning into an acid precipitating bath a solution of cellulose xanthate. No. 2,085,513. Adolf Steindorff and Gerhard Balle, Frankfort-am-Main-Hochst, Germany, to I. G., Frankfort-am-Main, Germany.

Process and apparatus for handling rayon cakes. No. 2,086,100. Geo. Wm. Steiger, Jackson Heights, N. Y.

Production artificial materials from a solution of an organic derivative of cellulose by extrusion into a coagulating medium. No. 2,086,122. Wm. Alex. Dickie and Percy Frederick Combe Sowter, Spondon, near Derby, England, to Celanese Corp. of America, corp. of Del.

Manufacture artificial silk, adding an alkali metal hexa meta phosphate to a viscose solution prior to filtration. No. 2,086,309. John Wharton, Liverpool, England, to America Enka Corp., Enka, N. C.

Water, Sewage Treatment

Treatment sewage, industrial waste, etc. No. 2,084,659. Philip B. Streander, Scarsdale, N. Y., to Underpinning & Foundation Co., Inc., New York City.

Method conditioning boiler water. No. 2,085,828. Cyrus W. Rice, Pittsburgh, Pa.

Product for treating water, comprising a basic zinc compound and a basic aluminum compound dissolved together with an excess of caustic soda in solution. No. 2,085,966. Sydney P. Foster and Geo. H. Sill to Bird-Archer Co., all of Chicago, Ill.

System of mineral treatment for recovering rare metals. No. 2,086,-322. Chas. B. Ulrich, Jamestown, N. Y.

Miscellaneous

Clouding Substances in Vegetable Oil

In method described, 12.5 cc. each of oil and acetone are shaken with 3 cc. of acidified saturated aqueous calcium chloride in a centrifuge cup so constructed that the oil-water interface lies within a graduated constriction. After centrifuging for fifteen minutes at 1500-1600 revolutions per minute, the volume of the precipitate is read off the scale. *Z. Unters. Lebensm.*, 71 (1936), 345.

Colored Rubber Powder

A colored rubber powder is the basis of U. S. P. 2,053,530. Process not only makes possible increased capacity in a rubber mill and a saving of power, but enables realization of maximum coloring effect in the resulting rubber compound through use of a given amount of coloring agent.

Carbon Black from Anthracene

Manufacture of carbon black from anthracene is reported in Germany by Consul Sydney B. Redecker, Frankfurt-am-Main. This move substantiates recent German efforts towards independence in carbon black requirements.

Polishing Cement

A cement for polishing wheels which requires no heat in preparation has been developed by Midwest Abrasive Co., Detroit, Mich. Through use of a special thinner, any density of cement required can be made up so that wheels of varying densities can be surfaced uniformly.

Treatment Lead Concentrates

At the Halkyn mine, North Wales, an electrolytic process for production of lead and sulfur from mill concentration has been in operation on a semi-commercial scale for about two years, *Bull. Inst. Mining and Metallurgy*, Dec. 1936. Process, which depends on the electrolysis of a fused chloro-sulfide melt to produce both lead and sulfur direct from concentrates in one operation, possesses some outstanding advantages over the established pyro-metallurgical method of reduction. One feature in particular is that it produces sulfur direct from the ore as a salable product; it is unnecessary to erect a costly plant for the manufacture of sulfuric acid from the sulfur gas, or alternatively, to render the gas innocuous to plant and animal life before disposing of it as a waste product. Lead of 99.95 per cent. purity, and sulfur 99.5 per cent. purity is being obtained from the concentrates. The fundamental soundness of this process having been proved, attention is now being turned to the treatment of "cell skimming."

Non-adhesive Rubber Surfaces

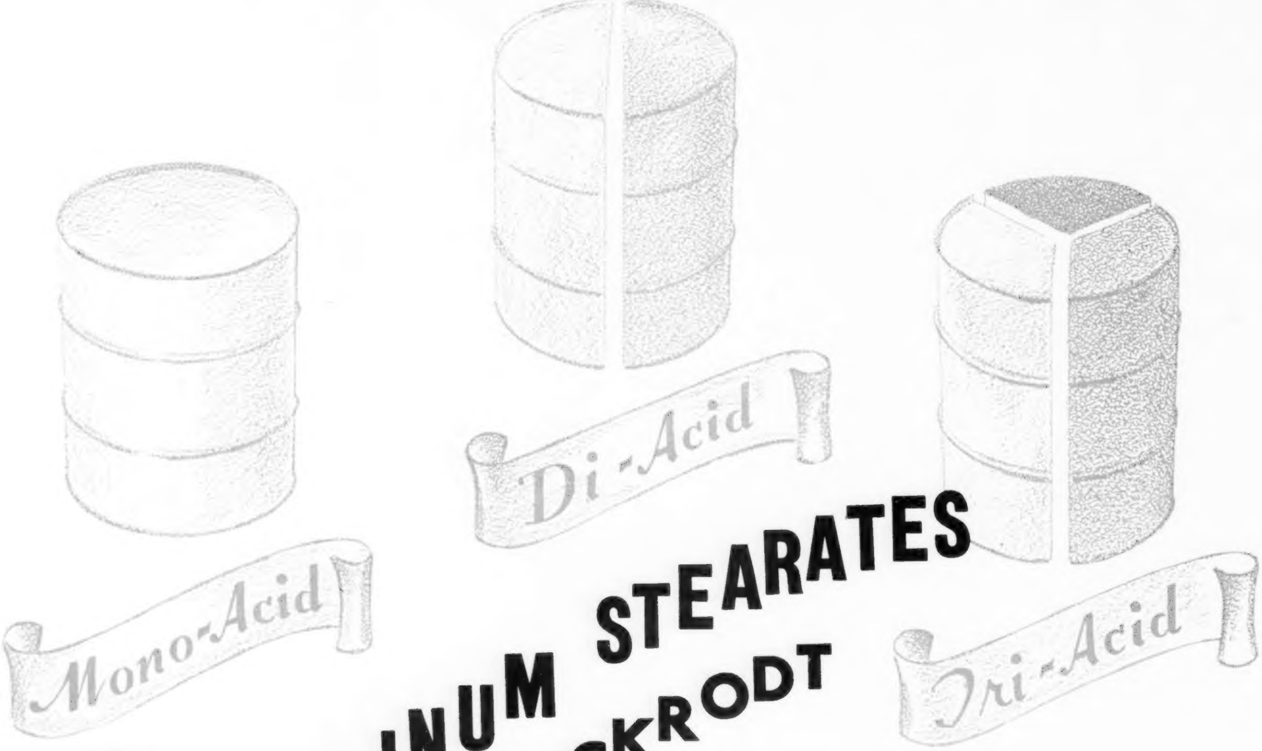
New process, developed by Magyar Ruggyantaarugyar, overcomes disadvantage which rubber products have of being adhesive to the skin. Rubber articles are covered with a felt-like fibrous material by treatment with an aqueous latex dispersion which contains powdered plant fibers, silk or cotton waste, rubber sponge grains, etc. To obtain rubber articles permeable to air, a foamy layer is produced on these surfaces. Sudden heating bursts the bubbles and instead of the usual spongy mass, a loose, air-permeable material is formed which can be vulcanized by the usual methods. *Rubber Age*, July, 1937, p. 241.

CHEMICAL SPECIALTIES

HOUSEHOLD
INDUSTRIAL
AGRICULTURAL

- Textile Processing
- Boiler Compounds
- Textile Specialties
- White Synthetic Enamels
- Phenolate Soap Process
- New Names and New Goods
- Trade Marks and Patents

The new National Oil Products plant at Cedartown, Ga.



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ACID BASE RATIO EASILY ADJUSTED . . .

Years of research have shown the importance of correct Aluminum Stearate acid-base ratio for the processing of oils and solvents. These three new Aluminum Stearates can be mixed to give you any desired ratio. You can save time and effect valuable economies by *standardizing* your formulas with these *standardized* Stearates.

These Aluminum Stearates are not special mixtures, but definite chemical compounds of highest quality. Every batch is manufactured to the same exacting chemical standards, thus assuring you uniform results in your Stearate processes.

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Test the behavior of these new Aluminum Stearates in your experimental laboratory with your own formulas and raw materials. Take advantage of the generous trial offer without delay. See how easily and accurately the acid-base ratio can be adjusted to your varying requirements.

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Magnesium Stearate
- Impalpably Powdered

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1 *Aluminum Stearate Technical M* (mono-acid)—Produces soft greases—causes definite flatting of varnishes, with less jelling tendency.

2 *Aluminum Stearate Technical D* (di-acid)—The grade most widely used for paints, varnishes, lubricants, and waterproofing materials. Stearate investigations logically start with this grade. M and T grades may be added as modifying agents. The M grade will tend to make greases harder, while the T grade will help to reduce graininess, brittleness, and bleeding.

3 *Aluminum Stearate Technical T* (tri-acid)—Can be dispersed in oils and solvents to a higher concentration than either the D or M grade with less jelling tendency in certain formulas. Recommended for certain types of waterproofing material.

TWO OTHER ALUMINUM STEARATES

Aluminum Stearate Technical Fluffy is chemically similar to the D grade, but slightly finer and bulkier.

Flatting Agent No. 22 will cause less jelling in certain varnishes than the other grades.

Mallinckrodt Aluminum Stearates are Made to Specifications for the Paint, Varnish, Lubricant, Waterproofing, and Similar Industries.

SPECIAL OFFER!

5 Pounds of Each Grade (M, D, and T) for $3.50

Mallinckrodt Chemical Works,
St. Louis, Missouri. 72 Gold St., New York, N. Y.
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Send me prepaid the trial quantities of the new standardized Aluminum Stearates (5 pounds of each of the three grades—M, D, and T).

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Boiler Compounds

By Benjamin Levitt, F. A. I. C.

TREATMENT is required because water often contains scale forming compounds, whether it be ground water or surface water. Fuel is wasted when a boiler or its tubes are encrusted with scale, since scale 1/8 inch in thickness causes a fuel loss of 10 per cent. Furthermore, since the scale covered sheet absorbs more heat, buckling and eventual burning out of the metal may result.

Scale forming minerals are dissolved by the water as it flows overland or between subterranean rock and other strata. Thus, we find magnesia and calcium carbonates and sulfates, chlorides, iron and alumina, CO_2, oxygen, besides mud and algae in the water supply. Water containing these dissolved chemicals is known as hard water.

There are various degrees of hardness, depending on the amount of these materials in solution. Water containing:

0- 3 grains per gallon is called soft water.
4- 7 " " " " " moderately hard.
7-12 " " " " " hard.
Over 12 grains per gallon is called very hard.

Hardness may be temporary or permanent. Temporary hardness is caused by calcium bicarbonate and can be reduced by boiling. This chemical is decomposed to calcium carbonate ($CaCO_3$), which is precipitated and CO_2 which passes off with the steam. Despite this reduction in hardness, scale may form due to an accumulation of the other incrustants after the water has boiled off. It is for this reason that many boiler compounds and preparations have been marketed.

How Hardness is Determined

Hardness is usually reported in terms of grains $CaCO_3$ equivalent per U. S. gallon, which is equivalent to parts per 58,341. Sometimes it is reckoned as parts per million. To convert grains per gallon to parts per million, multiply grains per gallon by 17.14. To convert parts per million to grains per gallon multiply parts per million by 0.058.

Hardness is also measured by means of titration of 50cc. of water with a standard soap solution. It is really a measure of the amount of soap required to create suds that remain for five minutes over the surface of that amount of water, under standard conditions. For complete details see "Standard Methods of Water Analysis," published by the American Public Health Ass'n, New York City.

By external treatment we mean that the water is treated in a machine before it enters the boiler. Lime and soda are used in one system. These are added to the water in carefully regulated amounts, according to the requirements of the supply, and the precipitated scale forming chemicals are filtered out before the water is passed into the boiler. A modification of this method is the addition of the chemicals to preheated water. This facilitates the reaction and permits of a smaller reaction tank. However, neither of these processes yields water of zero hardness.

By far the most efficient method is one in which the water is softened to zero hardness by means of zeolites. Zeolites, so called base exchanging minerals occur in nature as green sand, are also manufactured synthetically. In some respects the synthetic material is superior to the natural. Zeolites are silicates of sodium and aluminum. When hard water is passed over or through such minerals, the scale forming components are absorbed by the zeolite and converted to insoluble silicates, which are filtered out by the machine. When the mineral has absorbed its capacity of lime and magnesia compounds etc., common salt is poured into the machine, and the brine formed is washed through the mineral, thus converting the latter to its original state, when it may again be used to soften water.

In water containing large amounts of bicarbonates, a lime-zeolite combination may be used. In this process the lime combines with the CO_2 forms a precipitate as in the lime soda process, excepting that the soda here is furnished by the zeolite.

The distinct advantage of the zeolite process over others, is that it reduces the water to zero hardness and does not require special skill or highly trained technicians to operate. Any plant workman can operate the machine.

Internal Treatment

Specialty manufacturers will be interested chiefly in this type of treatment, wherein the compound is added directly to the boiler feed water, and enters the boiler with the water. The entire chemical combination therefore takes place inside the boiler. The virtue in this method of treatment is that the incrusting minerals are precipitated out of solution in the form of a colloidal sludge, which may be expelled from the boiler when it is "blown down" once or twice a day.

Materials Used

Boiler compounds are prepared to treat specific conditions of the water supply in each locality. They are also designed, at times, to eliminate scale already formed. The chief materials used are sodium silicate, sodium carbonate, caustic soda, sodium aluminate, trisodium phosphate, tannins, slippery elm, Irish moss, sodium chromate, sodium alginate, starch, glucose, kerosene, graphite, and barium compounds.

A special sodium silicate for boiler use is recommended by its makers, to be used daily in the proportion of 1 to 1¼ pounds per grain of hardness in the water, for each 100 H. P.

Below are examples of compounds used:

U. S. Navy Specification 13 C 3 G

Anhydrous sodium carbonate	44%
" disodium phosphate	47
Corn Starch	9

U. S. Dept. of Commerce Lighthouse Service Spec. No. 542

Calcined sodium carbonate	68–70%
Trisodium phosphate	19–22
Dextrine of Starch	1–2
Tannic acid derived from mangrove bark, cutch or catechu, not less than	4

City of N. Y. Boiler Comp. Spec. 5-C-1

Anhydrous sodium carbonate	76%
Trisodium phosphate	10
Starch	1

and sufficient cutch or dry extract of hemlock, oak or chestnut bark to yield 2% of tannic acid. The remainder to consist of water and only such impurities as are common to the ingredients.

The above are illustrations of compounds to prevent scale formation. What about scale already formed? Graphite and

kerosene are used for this purpose. They accomplish this work solely by mechanical means. Both of the above, and also caustic soda which is frequently used for the same purpose, should be used with caution.

Simple Calculation for Boiler Water Treatment

Steam engineers figure that a boiler evaporates 34 pounds of water per hour per H. P. Another general average that they work on is that one grain of hardness requires one grain of chemical reagent for its precipitation. Knowing the H. P. of the boiler, and the number of hours of operation, it is a comparatively simple matter to compute the amount of treatment necessary for each day's run.

Wetting Out Agents in Mercerizing

Mercerizing has been considerably simplified since the introduction of efficient wetting-out agents. Such assistants must respond to the following conditions:

(1) Wetting-out agent should dissolve to a clear liquid in soda lye, concentrated to 27-32° B., and must not in the course of work become turbid nor cause separations. It should not be volatile, nor contain volatile fractions which in volatilizing would decrease or annul the wetting-out property of the agent. In prolonged use the agent should not lose its initial qualities. When the lye is diluted, that is, in rinsing the yarn on the machine, the wetting-out agent or its components should not deposit impurities on the fibre in the course of bleaching or dyeing.

(2) Chemical and physical action of the lye on the cotton must not be harmfully modified by the agent. For instance, the lye with the wetting-out agent in it must not foam during the run on the machine. The formation of foam causes the lye to soak in less readily in certain conditions and may lead to uneven results. Foam forms carbonates in the lye, as a consequence of bringing the lye into closer contact with the air. The agent must have no effect on the bleaching and dyeing processes and must not damage the fibre.

(3) Not only the period of wetting-out during the time that the cotton is totally immersed in the lye but also its effect on the shrinkage are important factors in determining the efficiency of a wetting-out agent. It has been noted that the products that wet-out slowly have a much more favorable effect on the shrinkage than the wetting-out agents that act quickly. Attention must be paid to this point, as the shrinkage is in direct relation to the swelling of the fibre and on this depends the lustre and affinity for coloring matters of the cotton.

(4) The wetting-out agent must not attack the iron parts of the mercerizing machine nor the India rubber of the squeeze rolls. Damage of either sort would pollute the lye, with the risk of soiling the goods.

(5) Used lye and strongly alkaline rinse water have several uses in textile works. In some they are used in scouring yarn and piece goods, in others in soap-making. In large plants the lyes are made up again with all the effluents from mercerization, using them as the fundamental solution for caustification. The wetting-out agent must have no harmful effect on any of these treatments making use of residual lye and alkaline rinsing water is a prime economical necessity in mercerizing works.

(6) Price of the wetting-out agent is of first importance when unbleached yarn has to be mercerized. Price and quantity to be used may determine the adoption of the process.

This method has undeniable advantages over the old method of mercerizing unbleached good, in which the goods are thoroughly well scoured and entered wet into the machine in contact with the lye. With the wetting-out agent added the goods are entered dry and the concentration of the lye decreases less rapidly. In consequence, the bath can be brought up to strength in the course of work with much weaker lyes than in the old process. Also the temperature of the bath is raised to much less a degree, so that there is less necessity to refrigerate than in the old method. This is a saving, and another advantage is that there is less loss of weight of the goods. The loss in scouring is eliminated.

There may be no gain in lustre, but the wetting-out method at least is not inferior in this respect. Yarns dyed after mercerizing in the grey state by this method are not inferior to yarn scoured, mercerized and dyed. If all the stated requirements are satisfied, the process offers the possibility of shortening and modernizing the mercerizing treatment. W. Bruckhaus in *Klepzig's Textil—Zeitschrift.*

New Self-emulsifying Oil

Chemical specialty manufacturers will find Diglycol Laurate, non-hygroscopic, self-emulsifying oil an important new product, which promises unlimited possibilities in varied fields as indicated by its properties: amber oil self-emulsifiable in water to form milky-white emulsions; non-hygroscopic and high boiling; miscible with alcohol, glycerine, glycol, hydrocarbons, etc.; pH of 5% aqueous dispersion 8.0; practically odorless; non-toxic and edible; low surface tension and viscosity.

Manufacturer, Beacon Co., 89 Bickford St., Boston, Mass., states that wood, leather metal and lacquer emulsion makers will be interested in its emulsifying action on oils, oil soluble dyes, hydrocarbons, etc.; food and cosmetic makers in its edibility and non-toxicity; dye cleaners in its powerful detergent capabilities and the fact that it does not build up pressure on the filters; and the paper and textile industries as a general emulsifying agent, and because of its tendency for retaining moisture.

Slate-like Blackboard Finish

Slatite, an air-drying lacquer enamel, which finishes wood, fiber, wall board, cardboard, pressed paper, and other materials with a surface resembling slate, has been developed by Maas and Waldstein, Newark, N. J. New finish takes chalk-marks like slate, and the marks can readily be removed with an ordinary blackboard eraser. Finish is washable and durable, and, when it becomes worn, can be readily renewed by spraying on another coat. It is being used for the production of toy blackboards and slates; for inexpensive light-weight and portable blackboards for the use of schools, colleges, lecture rooms, engineering and business offices, and stores.

Economical Solvent Reclamation

Burto is a product being used by dry cleaners for successful and economical solvent reclamation. The Burto Co., 521 Fifth Ave., N. Y. City, maker, claims the following advantages: can be used with any solvent, removes slimes, odors, impurities, avoids use of caustics and chemicals, can be used in any system, and is easy to use.

Enamel for Concrete

Pli-Namel is said to overcome the disadvantages of regular oil base enamels on concrete surfaces, especially where moisture in any form is present. New enamel is made from a Pliolite base and is not affected by the chemical action of lime salts or other minerals in the concrete. It is said to protect against concrete dusting, withstand moderate traffic, dry with a high permanent gloss, and to cover on an average from 450 to 500 sq. ft. per gal. Manufacturer is Glidden Co., Cleveland, O.

Acid-Resistant Floor Material

Rockflux, acid-resistant floor material for application as a total floor over old or new concrete floors, is a product of Flexrock Co., 800 No. Delaware Ave., Philadelphia. Product is result of combining diabase and quartz through use of a flux in which calcium and other elements are reduced to almost zero. Other advantages claimed are: low cost, abrasion resistance, quick-setting, and simplicity of installation.

British Progress in Textile Finishing

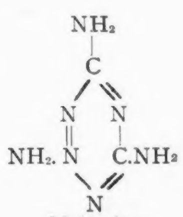
By A. J. Hall, B.Sc., F.I.C., F.T.I.

THE Tootal anti-crease finish for cotton and rayons has the disadvantage that the synthetic resin involved in this process (urea-formaldehyde) requires certain conditions—high temperature and acidity—which may adversely affect the durability of the cellulosic fabric, and recent British progress points the way to avoid these undesirable features.

One method for mitigating the harmful effect of the acid is to employ a substance which itself is not acid, but is capable of liberating acid during the reaction. Substances of this type which have been found effective (B.P. 431,703) are glycerol diacetate, formamide, aniline acetate, and the ammonium salt of acetone-bisulfite. Resulting fabric is said to be softer than when a free acid is employed to accelerate the condensation between the formaldehyde and urea. Salicylic acid has also been suggested. Thiourea is obviously an alternative to urea, but various other nitrogen compounds have proved suitable. By heating urea at 160° C. for 12 to 48 hours so that ammonia is evolved there results a technical mixture of guanidine, biuret, cyanuric acid, and guanyl urea which gives white resins with formaldehyde (B.P. 433,143).

Non-Acid Catalysts in U-F Condensation

In (B.P. 458,877), use of a particular type of urea substitute makes it possible to avoid the acid catalyst altogether which seems to be an important step forward. New process involves use of amino derivatives of 1:3:5-triazine such as melamine and formoguanamine. Condensation of these with formaldehyde takes place simply on heating to about 150° C. Melamine has the following constitution and results from heating cyanamide at 150° C.



Melamine

Use of para-formaldehyde instead of formaldehyde is recommended in some processes, lower temperature then being satisfactory (B.P. 766,829). Also by heating the fabric under pressure in the vapor of formaldehyde (B.P. 452,891) a high temperature can be avoided.

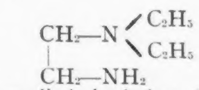
Use of a formaldehyde-urea synthetic resin in the treatment of cellulose materials for securing special dyeing properties in cotton and viscose rayon, and for making embossed effects permanent is noted. Thus resin manufacturers must produce and make available to dyers and finishers a water-soluble resin which can be directly applied to the textile material and there made insoluble by simple heating. The dyer and finisher would prefer to use the partly formed resin rather than a mixture of the components such as urea and formaldehyde. An attempt in this direction encountered by the writer was not satisfactory for the treated fabric became much yellower; it is generally essential that the resin shall be colorless. B.P. 435,871, describes the preparation of stable water-soluble urea-formaldehyde resins in which the stabilizing agent is an inorganic salt, such as potassium nitrate, sodium chloride, and disodium hydrogen phosphate.

Synthetic resins have also proved useful for application to textiles for the purpose of making them resistant to shrinkage in washing (B.P. 445,891). It is obvious that an increased use of formaldehyde and various nitrogen compounds will take place in this direction.

Lubricants and Softeners

Softness of handle is an important property in textiles and the finisher frequently must apply compounds having a lubricating or softening effect. Formerly, oils, such as olive and castor, were mainly employed for this purpose, but recently attention has been given to the production of the most complex bodies which have unexpectedly shown themselves to have very high softening powers.

Many softening compounds have been prepared by condensing oleic and stearic acids with ethylene diamine and its alkyl derivatives, especially unsym-diethyl-ethylene diamine, which has the following composition:



Unsym-diethyl-ethylene diamine

Instead of ethylene diamine it is possible to use ortho-phenylene diamine and 1:8-naphthylene diamine. Further, these derivatives can be treated with alkylating agents to yield quaternary ammonium bodies which have enhanced softening powers. The Sapamines (S.C.I.) belonging to this type have proved very useful for softening wool and other fibres for which they have substantive affinity. Information on the numerous products included in this range of substances can be found in B.P. 294,890, 219,304, 436,863, 439,890, and 433,230.

Another class of softening agent includes the thio-ethers made by reacting saturated or unsaturated monomeric aliphatic compounds (they should contain not less than C_8) or hydro-aromatic compounds, which contain a mercapto group, with 1:2-propylene oxides which are substituted in the methyl group by a halogen, or hydroxy, or a mercapto radical. For example (B.P. 409,030), softening agents are obtained by reacting thioglycide with dodecyl alcohol, and dodecyl mercaptan with epichlorhydrin; these are oils.

Rubber latex has proved disappointing in its application to textile materials, although it might be expected to have good softening properties. Recent developments in the chlorination of rubber may result in the production of new compounds more suitable. The fatty alcohols and their sulfonation products constitute another class which have valuable uses in treating textiles. These alcohols are valuable, particularly as softening agents, while the sulfonated products will ultimately largely replace soap because of their detergent value and excellent stability in hard water.

A large number of wetting out agents are now available, and it is difficult to forecast which is likely to be the most important type, for the simple reason that almost each month sees the discovery of new classes of compounds having wetting out properties. In showing how products are used for these purposes which a few years ago would almost have been unbelievable, it may be mentioned that Peregal O, one of the most valuable wetting out agents for use in vat dyeing, is made by reacting ethylene oxide with octodecyl alcohol. Another type of wetting out agent is made from alkyl naphthalene sulfonic acids, especially isopropyl and dibutyl derivatives. Pyridine in mixture with various other substances, particularly sulfonated oils and fatty alcohols, is an excellent wetting out agent, and in

addition products of this type have good dispersing power towards fatty impurities in textiles being treated and also towards various dyes, especially vat dyes.

In printing with vat dyes it has been found that presence in the printing paste of various betaine (B.P. 420,095 and 446,269) and quaternary nitrogen and phosphorus, and ternary sulfur compounds assists the better fixation of the dye. Many of these auxiliaries are very complex (B.P. 439,675, 443,638, and 443,588) and include such substances as octodecylpyridinium bromide, triphenyl-benzyl-phosphonium chloride, and trimethyl-lauryl-ammonium hydroxide. Similar substances also form the basis of certain products (B.P. 422,466) now being sold for stripping the color from vat dyed materials.

Solvent for Cellulose

Recently, tetramethyl ammonium hydroxide has been introduced as a solvent (Tetrone) for cellulose. This substance is strongly alkaline like caustic soda, but has higher solvent power for cellulose. It seems likely that with such organic bases the application of cellulose finishes to textiles will be much facilitated. The advantages of proteins, such as lecithin for textile finishing, have also been recognized—its substantive affinity is most valuable since it may allow the production of *permanent* soft finishes in contrast to those which are destroyed in the first wash of the yarn or fabric. Lecithin is not very stable to acids and alkalis, but researches are in hand to modify this substance so as to give it the required stability. *The Chemical Age*, July 3, '37, p. 3.

Low Cost Resinous Pitch

Nuba, a low-cost resinous pitch, is being produced by Neville Co., Pittsburgh. It is a dark thermal-softening plastic of unusual properties and sold in several grades:—80-95 deg. C., 100-125 deg. C., and 135-150 reg. C. melting points. Color is brown to black. It is partly soluble in petroleum solvents upon warming, and almost entirely soluble in aromatic solvents. Its outstanding properties are toughness and elasticity. It softens upon being heated and may be blended with numerous other thermoplastic materials, such as waxes, resins, pitches, etc., by first melting the waxes, etc., and then adding the "Nuba," followed by mechanical agitation until completely blended.

Product should find increasing use in the rubber industry where it may be used as a compounding agent, filler and softener. Floor tile compounds may be advantageously blended incorporating Nuba, as it exhibits unusual penetration characterists and imparts good wear-resisting qualities. By comparison, melting point for melting point with the usual roofing pitches, Nuba has somewhat less tendency to "cold flow," and is thus admirably suited for use in steep roof coatings.

Blends of Nuba with paraffin are brown dul-finish waxy materials, homogeneous in nature and varying from soft to hard. By means of such blends, it is possible to produce a whole range of "waxes," with melting points varying as desired between those of paraffin and Nuba and such "waxes" are recommended for leather dressing compounds, polishes, etc., where color is not an object. Product's high melting point and binding strength will be useful also in briquetting, low priced molding compounds, adhesives, and all types of binders, while electrical control manufacturers will find Nubas of interest as components of composition insulation block such as switch blocks, terminal blocks and the like.

Propylene Stearate

In the manufacture of non-alkaline cosmetics and in the pharmaceutical industry propylene stearate promises to be of particular interest as a thickening and emulsifying agent. Manufacturer, The Beacon Co. 89 Bickford St., Boston, Mass., states that viscosity of its emulsions varies from a thick cream to a thin liquid, depending on the wax concentration. It has the following properties:

White, wax-like solid, M. P. 57° C.; soluble hot in alcohols, oils, and organic solvents; contains no free alkalies or amines; 5% dispersion in water has a pH of less than 7.

It finds use as:

Pour point depressant for lubricating oils; constituent of textiles sizes—particularly rayon and silk; lubricant for paper and cardboard in dry die forming; in white shoe and polishes.

As a thickening agent it offers many advantages. It is an excellent suspending agent for organic and inorganic materials in aqueous solution.

New Dispersing Agent

Release of a new dispersing agent, Leonil O Solution, of I. G. manufacture, is announced by General Dyestuff. Solution is not affected by the hardness of water, acid-alkali or salts used in the processing of wool. It has a dispersing effect on grease, fat, spinning-oils, etc., thereby giving a basis for fastness to rubbing. By boiling in an acid bath consisting of 1½-8% Leonil O solution and 2% acetic acid 30% for 20 minutes, it degreases to such an extent that no difficulties will arise in the subsequent dyeing. This also applies for the preliminary treatment, in the dyeing or for the after treatment. It may be used for the dissolving and dyeing of dyestuffs; it not only acts as a dispersing agent but also as a levelling agent. It may be used to advantage in dyebaths of acid, afterchrome, monochrome or mordant dyestuffs. Additions of ½-1½% Leonil O solution in the dyebath effect a more even dyeing of clearer shade and improved fastness to rubbing.

Finish for Seaming Strength Rayons

New Fiber-Loc finish of U. S. Finishing Co., is said to lock and set yarns, giving fabric additional strength that holds fast at the seams--very useful for cheaper rayons. Repeated dry cleanings are said to leave finish relatively unaffected.

White Synthetic Enamels

A new line of white synthetic enamels, formulated to meet specific requirements such as low bake, high bake, etc., has been developed by Gilbert Spruance Co., Philadelphia. They may be sprayed, dipped or brushed, depending on formula; produce an intense full-bodied white film in one coat, and are non-poisonous.

Rubbing Compound

Dri-Dark Rubbing Compound, developed primarily to overcome white or gray deposits ordinarily left from regular rubbing compounds in routings or corners, is announced by V. J. Dolan & Co., 1830 Laramie Ave., Chicago, Ill. It will match the finish after drying and cuts very rapidly and effectively.

Burn-proof Lacquer

Durtemp, new baking lacquer developed by Maas & Waldstein, Newark, N. J., withstands action of match flames, lighted cigars, perfumes, alcohol, and household chemicals. It is applied by dip or spray and can be used for finishing ash trays and similar products.

Sanding Emulsion

Sanding Emulsion F 4942, for sanding, polishing and rubbing finished surfaces, is announced by Varnish Products Co., 5208 Harvard Ave., Cleveland. It is harmless to all finishes, and combines ease of abrasive cutting of oil and naphtha with the detergent and cooling action of water.

Wax Substitute

A refined wax for use in wax emulsions which can be used as a substitute for the most costly and higher grades of Carnauba, as it makes a good light colored emulsion, is announced by Innis, Speiden, New York City. It dries with a good sheen and polishes well.

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CHEMICAL INDUSTRIES

Insecticides		Lubricants
Fertilizers	*Announcing the*	Inhibitors
Adhesives		Lacquers
Paints	**DECEMBER**	Fillers
Dyes		Sizes
Oils	**19 37**	Inks
Soaps		Waxes
Solvents	**1st ANNUAL**	Tanstuffs
Plasticizers	**ISSUE**	Detergents
Accelerators		Antioxidants

Chemical Specialties Catalog Section

A Buying Guide and Check List of Brands and Trade Names

Specialties Buying Guide

An alphabetical list of Chemical Specialties for Textile, Leather, Paper and Pulp, Rubber, Ceramic, Petroleum, Coatings, Plastics, Electroplating, Metal Refining and Working and other Chemical Processing and Agricultural Uses.

ABRASIVES FOR DETERGENTS, POLISHES, etc.

Materials with gentle abrasive action which clean or polish without marring the smooth surface of brass, silver and other soft metals, enamels, glass, marble, etc. See also Bentonite, Cuttlefish Bone, Diatomaceous Earth, Talc, Tripoli, Volcanic Ash: CHEMICAL BUYER'S GUIDEBOOK.

American Colloid Co, 263 W Superior st, Chicago, Ill
American Cyanamid & Chemical Corp, 30 Rockefeller Plaza, New York City
Chrystal, Chas B, Co, 13 Park pl, New York City
Johns-Manville, Inc, 285 Madison ave, New York City
McNulty, Joseph A, 114 Liberty st, New York City
U S Talc Co, 147 Nassau st, New York City
Wyodak Chemical Co, 4600 E 71st st, Cleveland, Ohio

Barnsdall Tripoli Co, Seneca, Mo
Drackenfeld, B F & Co, N Y C
Independent Gravel, Joplin, Mo.
Nulite Polish, Brooklyn
Munning & Munning, Phila
Tabor Mfg, Phila
Technical Products, Pittsburgh

ABRASIVES, GRINDING

Materials of sufficient physical hardness to grind or polish the surface of metals, etc., by mechanical rubbing or wearing. See also Emery, Iron Oxide Red, Pumice, Rotten Stone, Silica: CHEMICAL BUYER'S GUIDEBOOK.

Aluminum Co of America, 1856 Gulf Bldg, Pittsburgh, Pa
American Abrasive Co, 100 Union st, Westfield, Mass
Carborundum Co, The, Niagara Falls, N Y
Norton Co, The, Worcester, Mass
Steel Blast Abrasives Co, 6536 Carnegie ave, Pittsburgh, Pa
Steel Short & Grit Co, 1934 Diamond st, Amesbury, Mass

Abrasive Products Co. So Braintree, Mass
Barnsdall Tripoli Co, Seneca, Mo
Bracher Agate & Abrasive Co, Summit, N J
Exolen Co, Blasdell, N Y
Garnet Products, So Danbury, N H
Hampden Grinding Wheel, Springfield, Mass
Minnesota Mining & Mfg Co, St Paul, Minn
Standard Silica Co, Chicago
Washington Mills Emery Mfg Co, N Grafton, Mass

ACCELERATORS, CONCRETE, see Hardeners, Concrete

ACCELERATORS, RUBBER

Chemical compounds, chiefly organic, which speed the curing process of rubber and improve the quality of the product. See also Aniline, Antimony Sulfide, Di-orthotolguanidine, Di-phenylguanidine, Paranitrosodimethylaniline, Thiocarbanilide, Triphenylguanidine, etc.: CHEMICAL BUYER'S GUIDEBOOK.

Amer Cyanamid & Chem Corp, 30 Rockefeller Plaza, New York City
Bauer Co, Inc, Philipp, 18 E 41st st, New York City
Doe & Ingalls, Inc, 56 Garden st, Everett Sta, Boston
du Pont de Nemours & Co, Inc, E I, (R & H Chemicals Dept), Wilmington, Del.
International Selling Corp, 70 Pine st, New York City
Monsanto Chem Co, 1700 S 2nd st, St Louis
National Aniline & Chem Co, 40 Rector st, N Y City
Wishnck-Tumpeer, Inc, 295 Madison av, New York City

D P W Co, The, Akron, O
Hall Co, C P, Akron, O
Herron & Meyer, Inc, Akron, O
Kendall, J A. (Bkr), Akron, O
Naugatuck Chem Co, N Y
Rubber Service Labs, Akron, O
Schulman, Inc, A, Akron, O
Standard Chem Co, Akron, O
Union Chem Sup Co, Akron, O
Vanderbilt Co, R T, N Y
White & Co, Akron, O

ACCELERATORS, TANNING

Chemical compounds or mixtures used to hasten the tanning action of natural or synthetic tanstuffs and which improve the texture of the finished product.

American Cyanamid & Chemical Corp, 30 Rockefeller Plaza, New York City
National Oil Products Co, 15-25 Essex st, Harrison, N J
Onyx Oil & Chemical Co, 15 Exchange Pl, Jersey City, N J
Trask Co, Arthur C, 4103 S La Salle st, Chicago, Ill

Apex Chemical Co, N Y C
Arkansas Co, N Y C
Colloids, Inc, Newark, N J
Hauthaway & Sons, C L, Lynn, Mass
Salem Oil & Grease Co, Salem, Mass
Stahl Finish Co, Peabody, Mass
Tannade, Inc, Chicago
Webster & Co, A L, Chicago

ACETATE DYES, see Dyes, Acetate

ACIDS, FATTY DISTILLED

Specialized, refined grades of coconut, cottonseed, linseed, oleic, palm, peanut, soybean, oils etc. used in the manufacture of synthetic resins, soaps, kier assistants, driers, metal polishes, insecticides, textile finishing compounds, lubricants, dispersing agents for rubber.

American Chemical Products Co, 75 Rockwood st, Rochester, N Y
Spencer Kellogg & Sons Sales Corp, Niagara Square, Buffalo, N Y
Wecoline Products, Inc, 15 E 26th st, New York City

Swann-Finch Corp, N Y
Woburn Degreasing, Kearny, N J
Wyandotte Oil & Fat, Wyandotte, Mich.

ACTIVATED CLAY, see Clay, Activated

ACTIVATORS, RUBBER

Inorganic and organic materials supplementary to accelerators in speeding up the processes of vulcanization, curing, and stabilizing various types or grades of crude rubber. Principal activator ingredients are litharge and other lead compounds, calcined magnesia, hydrated lime, and zinc oxide.

American Cyanamid & Chemical Corp, 30 Rockefeller Plaza, New York City
Belmont Smelting & Refining Wks, 322 Belmont ave, Brooklyn, N Y
du Pont de Nemours & Co, E I, Wilmington, Del
International Selling Corp, 70 Pine st, New York City
New Jersey Zinc Co, 160 Front st, New York City
Wishnick-Tumpeer, Inc, 295 Madison ave, New York City

Amer Smelt & Ref Co, N Y C
Amer Zinc Sales Co, Columbus, O
Anaconda Sales, N Y C
Eagle Picher Sales, The, Cincinnati, O
Ozark Smelt & Ref Co, Cleveland, O
Superior Zinc Corp, Phila, Pa
Vanderbilt Co, R T, N Y C

ADHESIVES

Materials which by viscosity bind or cause surfaces to stick together. See also Cements, Glues, Glue Substitutes, Gums, Mucilage, Pastes, Sizes. See also Dextrin, Gelatine, Sodium Silicate, Starch: CHEMICAL BUYER'S GUIDEBOOK.

Allen, L B Co, 6759 Bryn Mawr ave, Chicago, Ill
Arabol Mfg Co, 110 E 42 st, New York City
Binney & Smith Co, 44 E 43 st, New York City
Cleveland Cleaner & Paste Co, 7275 Shaw ave, Cleveland, Ohio
National Adhesives Corp, 820 Greenwich st, New York City
Reliable Paste Co, 3560 Shields ave, Chicago, Ill
Stein, Hall & Co, 285 Madison ave, New York City

Armour Glue Wks, Chicago
Cudahy Packing, Chicago
Dodd & Co, A W, Gloucester, Mass
Elwell, B F Glue Co, Rockport, Mass
Fuller, H B & Co, St Paul, Minn
Harrington Glue, N Y
Hart, Wm C, Co, N Y
Madison Glue, N Y
Milligan & Higgins Glue, N Y

See rates on back page

Trade-Name & Brand Dictionary

An alphabetical list of the Trade Names and Company Brands in the Field of Chemical Specialties for Industrial and Agricultural Uses with Manufacturers and Definitions.

Specimen Page for Style, Size and Data

Cadux: Hanson-VanWinkle-Muning Co., Matawan, N.J., chemicals for electroplating.
Camacyl: John Campbell & Co., N.Y.C., dyes for rayon.
Captex: R. T. Vanderbilt Co., N.Y.C., rubber, accelerator.
Carbanthrene: National Aniline & Chemical Co., N.Y.C., dyes.
***Carbofrax**: Carborundum Co., Niagara Falls, N.Y., refractories.

CARBONEX:
The Barrett Co., 40 Rector st., New York City.
A softener and reinforcing agent. Experience has shown that in the manufacture of high quality black soling stocks, carbonex leatherizes the compound, provides necessary stiffness and hardness, improves resistance to checking and flex-cracking, tear and abrasion, and increases resistance to action of oils and greases.

Carnation: L. Sonneborn Sons, Inc., N.Y.C., mineral oil.
Carnau: Universal Chemical Co., Baltimore, emulsifying wax.
Castrolite: Royce Chemical Co., Carleton Hill, N.J., sulfonated castor oil.
Caulk-O-Seal: Calbar Paint & Varnish Co., Philadelphia, caulking compound.
Celax: Hercules Powder Co., Wilmington, Del., textile finish.
Cel-Ray Scourer: Onyx Oil & Chemical Co., Jersey City, N.J., scouring compound for textiles.
***Chikkarin**: Suzuki & Co., N.Y.C., mixed fertilizer.

CINCH:
Caled Products Co., Inc., Brentwood, Md.
Pre-spotter for dry cleaning that removes soil like soap and water, gets perspiration spots and stains. In any dry cleaning system—easy to apply on all fabrics, white or colored, including Celanese. Used straight: no time lost in mixing. $2.50 a gal. in case lots of 4-gallon jugs.

***Cin-dek**: The Paraffine Companies, San Francisco, paints, varnishes, lacquers.
Clepo: Gumm Chemical Co., Union City, N.J., detergents for metal.
Coblax: Standard Oil Co. of N.J., N.Y.C., rubber softener.
Clarinol: Hercules Powder Co., Wilmington, Del., pine oil.

COD-BAN:
American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York City.
A prepared mixture of beta naphthol and oil, ready for use for making tree bands without heating the solution. Preparation is greatly simplified by using Cod-Ban. 25-lb. pails and 100-lb., 240-lb. and 400-lb. drums.

Concentral: Hercules Powder Co., Wilmington, Del., textile softener.
Corlac: James B. Day & Co., Chicago, paint sealer.
Crea Linen Finish: Reliance Chem. Products, East Prov., R.I., textile finish.
Cerol: Sandoz Chemical Works, N.Y.C., waterproofing agent (textile).

CRYOLITE:
American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York City.
Non-arsenical insecticide for controlling all types of chewing insects, including codling moth and Mexican bean beetle. Used either as a spray or dust: is especially suitable where use of an arsenic is objectionable. 200-lb. bags and 400-lb. barrels.

CRYPTONE:
The New Jersey Zinc Co., 160 Front st., New York City.
White paint pigment which conforms ideally to the primer function known as "buffer action" in relieving stresses and strains between the finish paint and the old painted surface. It aids adhesion to all woods and to old paint, reduces cracking and checking, imparts moderate, controlled chalking and cleaning, and possesses excellent tint retention and non-settling properties.

CYANOGAS:
American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York City.
Fumigant and insecticide for killing rats, mice, moles, woodchucks, gophers, prairie dogs, etc. For fumigating greenhouses, warehouses, mills, soil, for controlling chinch bugs, grapeleaf hopper. Comes in 6 different physical forms and various packings from 4-oz. tins to 100-lb. containers.

Cyclo: R. R. Street & Co., Chicago, textile stain remover.
Palais: Bay State Chemical Co., Salem, Mass., leather finish.

PALATINE FAST YELLOW EL:
General Dyestuff Corp., 435 Hudson st., New York City.
Produces clear, bright yellow shades of somewhat reddish tone; notable for its level dyeing properties, good solubility, and suitability for machine dyeing. Because of its fastness, especially recommended for suitings and dress materials, carpet yarns, knitting yarns, and hosiery yarns. Readily dischargeable to pure white.

Para-Dur: Stroock & Wittenberg Corp., N.Y.C., synthetic resin.
Paragene: Eaton-Clark Co., Detroit, textile solvent.
Paraplex: Resinous Products & Chem. Co., Philadelphia, synthetic resin.
***Pemco**: The Porcelain Enamel & Mfg. Co., Baltimore, frits, oxides, enamelers, opacifiers.
Penetrall: Industrial Aniline & Chemical Co., Germantown, Pa., textile penetrant.

PENNANT:
The Davies-Young Soap Co., Dayton, O.
Scientific compound of basic materials of vegetable origin for use in petroleum solvent dry cleaning. Insures against objectionable odor. Contains high percentage of anhydrous soap with necessary cleaning aids to assure maximum detergency. Dissolves quickly and thoroughly to smooth solution with solvent.

Peregal O: General Dyestuffs Corp. N.Y.C., leveling agent and stripper for textiles.
Permansa: The Sherwin-Williams Co., Cleveland, O., dry colors.
Phosphines: National Aniline & Chemical Corp., N.Y.C., leather dyes.
Picrin: R. R. Street & Co., Chicago, stain remover.

PIGMENT WHITE W-561:
Jacques Wolf & Co., 350 Lexington ave., Passaic, N.J.
Pigment white W-561-A is especially adjusted for use with any natural gum thickener, Pigment White W-561-T is to be used with a starch-tragacanth thickener. The finely suspended pigments of these products give a free flowing body to the printing paste for any textile.

***Pinesol**: General Naval Stores Co., N.Y.C., paint solvent.
Pipsol: Monsanto Chemical Co., St. Louis, rubber accelerator.
Plastex: Binney & Smith, N.Y.C., rubber substitute.

PLIOLITE:
The Goodyear Rubber & Tire Co., Akron, O.
New synthetic hydrocarbon resin. Pliolite finishes, (paints, enamels, primers) possess superior resistance to acids, alkalies, moisture, salt water, heat, rust and abrasion; bond solidly to any surface with hard film that does not break down or blister. They are quick-drying, non-skinning, tasteless, odorless, non-toxic; level readily.

Plymouth: M. W. Parsons, N.Y.C., mineral oil.
Pontol K: du Pont Co., Wilmington, Del., denaturant (alcohol).
Preservol: R. W. Greeff & Co., N.Y.C., gum preservative.
Primol: Standard Oil Co. of N.J., N.Y.C., mineral oil.
Product 506: Borne Scrymser Co., N.Y.C., fat liquor.
Protozyme-T: Jacques Wolf & Co., Passaic, N.J., desizing agent.
Puerine: The Martin Dennis Co., Newark, N.J., bate.

PYRATEX:
R. R. Street & Co., 561 Monroe st., Chicago.
A wet or dry spotter which removes hard set grease and paint during wet scouring and wet spotting, leaves no odor in the fabric, and is safe to Celanese and colors of average fastness. Case 6 x 1 gallon cans at $2.75 per gal.; single 1-gallon cans at $3.10 per gal.

PYREFUME SUPER 30:
S. B. Penick & Co., 132 Nassau st., New York City.
A concentrated fly spray base representing 30 pounds of assayed, tested pyrethrum flowers to each gallon and containing 3.225 grams pyrethrins to each 100 C. C. S. Very economical and assures the spray manufacturer that his product will be uniform.

Vanite: American Disinfecting Co., Sedalia, Mo., stain remover.

VAT GUM W-696-T:
Jacques Wolf & Co., 350 Lexington ave., Passaic, N.J.
This thickener for vat colors contains the required amounts of hydrosulfite and alkali. It gives greatest color values, full penetration, sharp outlines, and its smooth, syrupy body does not go ropy.

Tell the Buyers What Your Trade Names Mean

Fifty words of description, suggested uses, sales talk, prices — with your trade name or brand and your complete street address printed in bold face type to catch the reader's attention—

1-4 listings costs	**$6.00 each**	**10-14 listings cost**	**$4.50 each**
5-9 " "	**5.00 each**	**15 or more " "**	**4.00 each**

A New and Better Way to Increase Your Sales

"If only I could reach the possible users of our new specialties and tell them what these can do and how they might use them--" Isn't that one of your chief problems?

These prospective customers of yours have their own problems too, for they have no place where they can find out who sells buffing compounds, or sulfonated teaseed oil, or Bordeaux mixture. They often need to know whether "Hypodol" is a solvent or a lubricant, who makes "Mello-neats," or "Diazocel," or the "Mapico" brand of pigments. By the hundreds they write asking us just such questions. They badly need a Buying Guide for Chemical Specialties and a Chemical Trade Name and Brand Dictionary. They will welcome it and use it almost daily.

Therefore, with the December 1937 issue of CHEMICAL INDUSTRIES we shall publish the first annual number of the *Chemical Specialties Catalog*, a companion volume to our famous *Chemical Buyer's Guidebook*. We offer it to you makers of Chemical Specialties as a new, a better, a cheaper advertising medium that will help your sales every day during an entire year.

Direct to the Buyers

From A to Z—Abrasives to Zinc Anodes—the *Chemical Specialties Catalog Section* of CHEMICAL INDUSTRIES will list over a thousand distinct chemical compounds used in all process industries and in agriculture. Turn to the second page and you will see at once the scope of this buying guide—all the different specialties, each one briefly defined, and listed here under the firms who make each.

All listings are free and unlimited to actual makers of chemical specialties. The black type listings with full address are given to the advertisers—twelve such listings under twelve different products for each quarter page advertisement. In other words listings are free and so without obligation or expense send in your data for complete listing under all your specialties. But if you advertise you get listed in the bolder printing and with full address.

This advertising is sold in quarter page units and by taking space opposite your leading products you use the book to the best advantage. Here your story will be seen and read by users when actually in the market looking for real sources of supply. You can talk to them just when they want to learn about your specialties and their uses—the ideal tie-up between "reader interest" and "copy."

These quarter page spaces are sold at rates based upon the number of quarter page advertisements used in the next three annual editions. For example one quarter page in the next issue (a single insertion) costs $50. Three quarter pages (all used in the forthcoming issue or one each in the next three annual editions. For example, one quarter page in the next three years the rate is only $25 per quarter page payable upon publication. Cost, appeal, coverage—advertising which is effective and economical beyond reckoning.

Trade Name and Brand

On the third page is a sample of the dictionary part of the *Specialties Catalog*—a check list of the trade names and brands. These brands used for a whole line of specialties or chemicals are distinguished by the little stars. Such a check list is as necessary as the buying guide and it serves distinct purposes.

Chemical trade names are multiplying with great rapidity—over one hundred a month are being registered with the U. S. Patent Office and are illustrated and recorded in each monthly issue of CHEMICAL INDUSTRIES. A complete dictionary of them offers you an opportunity to identify your firm with its products. Your own trade names and brand are among your most valuable business assets. Your advertising, your mail work, much of your salesmen's time are all wisely spent in building up these assets by making them more widely and more definitely known. The more people who recognize what your trade names mean and associate them with you, the more you profit from these assets.

This dictionary will be a standard reference work, and here you can publish a fifty word description of your trade names. You may write a sound scientific description or a snappy sales talk, but be sure you tell plainly what your product is and how and why it is used, and if sold in standardized packages, give these containers and quantities, and if possible the prices. Make your description answer all the questions a prospective purchaser asks about this kind of chemical ware.

To encourage full definition of all your specialties the price has been made very low—$4.00 for 50 words is not as much as the cost of a single insertion of a "want ad" and this definition will stand for a year in a book that hundreds of chemical buyers will consult daily.

CHEMICAL INDUSTRIES

CHEMICAL SPECIALTIES CATALOG SECTION

will be published December, 1937, issue. Reserve space and send in your listings for the Trade Name Directory today.

149 Temple St. New Haven., Conn.

Industrial Specialty Companies Add to Personnel

Dr. Schwarz, Former Technical Editor, Rayon Textile Monthly, Now With Arkansas Co.—Wood, Well-Known in Paterson Dyeing Circles, Joins Royce Chemical—Burns With Onyx—

Evidence of rapid expansion on the part of many of the leading concerns in the industrial chemical specialties field is found in the number of new personnel added to research and service staffs within the past month.

Dr. E. W. K. Schwarz, well-known technical editor of *Rayon Textile Monthly* for many years, is now technical director for the Arkansas Co., N. Y. City producer of specialties for the textile field. His experience will also be available to chemists in textile plants. He received his early traning with Badische Aniline and then in '23 came to this country to join the pioneer dye firm of Kuttroff & Pickhardt, and later became a member of the General Dyestuff staff.

Wood in New England

Royce Chemical reports that P. J. Wood, formerly vice-president of Oriental Silk Printing, Paterson, has joined its staff. Mr. Wood will devote all his time and effort to the New England territory. He brings to this work an unusually good training and background of experience. He is a graduate of Leeds Boys Modern School and the University of Leeds. His apprenticeship was served with the Bradford Dyers Association. For 3 years he was chief chemist of American Silk Dyeing and Finishing, Hawthorne, N. J. and following this he was superintendent for 2 years of Peerless Finishing, Nyack, N. Y. For a period of 20 years Mr. Wood was vice-president of Oriental Silk Printing, in full charge of all its operations.

Mr. Wood is a charter member of the American Association of Textile Chemists and Colorists. He was president of this organization for 2 years, from 1930-1932, and was the first chairman of the N. Y. section.

Warwick Sends Rose to N. Y.

Warwick Chemical, Providence, has appointed Harold W. Rose, as general sales manager of the Impregnole Water Repellent Division, with N. Y. City headquarters at 580 5th ave. Charles M. Hayman is assistant manager of the division. Harry N. Karpen has been appointed general supervisor of the technical laundry service division.

Burns to Assist N. E. Woolen Mills

Onyx Oil & Chemical, Jersey City, announces that James E. Burns has joined its staff to render sales and technical service to woolen and worsted mills in New England. Mr. Burns, who is well known throughout the New England trade, has spent 6 years in the textile industry, specializing on woolen and worsted finishing. He is the son of James J. Burns, past president and now secretary of the National Association of Woolen and Worsted Overseers. His experience was gained with his father at the Livingston Worsted Mills, Inc., Holyoke, Mass.

He will operate out of the Onyx company's New England offices at 100 Fountain st., Providence.

Yake Now a Director of Royce

At the annual meeting of the Board of Directors of Royce Chemical, Carlton Hill, N. J., E. E. Yake was elected a director of the Company. There has been no change in the board since the Company was organized almost 10 years ago, and the enlargement was made at this time to parallel the company's growth. Mr. Yake joined Royce Chemical Jan. 1st, as assistant to the president.

Schneiderhan to Join Chipman

In the agricultural insecticide field Dr. Felix J. Schneiderhan, for several years superintendent of the West Virginia State Experimental Farm, has announced that he will join the staff of Chipman Chemical, Bound Brook, N. J., on Nov. 1st. He will be plant pathologist and entomologist, and will have charge of all research work of the company.

Charles Town Chemical is a new firm making agricultural materials in Charleston, W. Va.

Midland Chemical Laboratories Holds Sales Meeting

Company Celebrates "More Than a Third of a Century of Service"—Akis Chemical Buys Old Newport Plant at Passaic —Bennett, Commonwealth Color, Dies—Personal and Personnel Notes—

The Midland Chemical Laboratories, Dubuque, Iowa, held its sales convention on the 1, 2, and 3rd of July comprised of salesmen of all the different divisions of this great organization. Object of this convention aside from discussing present day methods of selling, was to acquaint the entire force with the extensive expansion program inaugurated at the beginning of 1937 made necessary by the ever increasing demand for Midland products and service.

All the salesmen in the employment of the Midland, regardless of location, accompanied by their wives, attended the convention at the Company's expense. Every state in the Union was represented, including all the U. S. possessions. Among this large group were many salesmen who have been with the company from 20 to 25 years, while the general average for each representative is 15 years of service, a wonderful record of loyalty and devotion any organization may well be proud to have.

In connection with the sales feature of the program, the entire organization joined in a mass celebration of "The More Than A Third Of A Century" of operation and service to the trade. Having completed the 34th year, as an outstanding manufacturer in this particular field, made it very fitting and appropriate that such a celebration be held as part of the regular program.

W. E. Klosterman, one of the leading salesmen of the Midland, directed each day's program, while J. C. Camm, sales manager, was general chairman of the program.

A trip through the large Midland Plant occupying 6 acres of space was a special feature of the program which acquainted the salesmen with the additional factory equipment that it has been necessary to install in order to supply the growing demand for Midland products. It has also been necessary to relocate the laboratory and enlarge it many times over its present size for research and analytical work in connection with the manufacture of their products.

To Make Waterproofing Compounds

The old Passaic plant of the former Newport Chemical Works has been taken over by the Akis Chemical Corp., a branch of the Sika Corp., Switzerland, and waterproofing compounds will be produced there. Dr. Emil Schmid, formerly chief chemist of the plant in Japan, will run the new works. For several years Akis has been importing its products from abroad.

Bennett Dies of Heart Attack

John Bennett, 50, well-known textile chemist and southern salesman for Commonwealth Chemical, Brooklyn, died of a heart attack July 8th. He was a native of England, served in the British army during the war, coming to this country early in the twenties.

European Bound

Several prominent executives in the industrial chemical specialty field are in Europe this summer and included in the list are E. C. T. Bick, president of Bick & Co., and Ralph Wechsler, National Oil Products treasurer. Mr. Wechsler will

be away 3 months and will visit England, France, Switzerland, Egypt and Palestine.

Hermann, Apex, on Coast

Dr. Seymour M. Hermann, president of Apex Chemical, together with Mrs. Hermann, left July 18th for an extended tour of Canada and the West Coast. Their numerous stops include pleasure seeking ones at Banff, Lake Louise, and Vancouver. At Vancouver, they will board their boat for the trip down the Coast to Seattle, San Francisco, and Los Angeles. At each of these cities, Dr. Hermann will establish closer and better relationship with the western representatives and customers.

Lieut. Stanford L. Hermann, of the research staff of Apex Chemical, has been ordered to active duty with his chemical warfare regiment to Edgewood Arsenal, Md., for the annual period of training. Prior to reporting, he will cooperate with experts in the Dept. of Agriculture at Washington with reference to bacteriological growth in which his company is interested.

Neva-Wet's New Laboratory

The Neva-Wet Corp. of America has opened a laboratory-auditorium at 500 5th ave., N. Y. City, where the consumer will be able to see just what tests are made to determine the serviceability of fabrics.

This laboratory was installed by the U. S. Testing Co. It will be open to the public until 4 o'clock in the afternoon and after that hour to store executives.

New Pest Control

Plans are rapidly going forward for the 5th Annual Convention of the National Association of Exterminators and Fumigators to be held at Hotel Peabody, Memphis, Tenn., Oct. 25-26-27th. It is expected that the principal speakers will be Lee A. Strong, Chief, Bureau of Entomology, U. S. Dept. of Agriculture, and Dr. Thos. E. Snyder, Senior Entomologist of the Bureau of Entomology, U. S. Dept. of Agriculture. Prof. J. J. Davis, of Purdue University, will be Dean of the Clinics.

The move to change the name of the association has been successful and it will now be known as the National Pest Control Association. The old name will also be continued, however, until after the Memphis convention so as to avoid confusion.

Wax Makers Seek Members

The newly formed Floor Wax Association is actively working for new members among producers who are not already in the group. Carl Schwank, general sales manager, R. M. Hollingshead Corp., is chairman of the membership drive committee.

Anti-Freeze Advertising Plans

With increased expenditure in 6 large national magazines and an enlarged two-month outdoor poster schedule, U. S. I. will endeavor to increase the number of motorists using Super Pyro anti-freeze from 4,600,000 in 1936 to 6,000,000 in 1937, reports Leslie Gillette, advertising manager.

This will be the 5th year of the product, Mr. Gillette said. Sales have risen consistently since 1933, when it was sold to 800,000 motorists.

Magazine list will include 4 general weeklies, a magazine distributed by 17 newspapers and a national farm magazine. Each will carry at least 3 insertions, making a total of 70,000,000 "impressions." The poster campaign will comprise 10,000 boards in 200 cities and towns. A variety of point of sale material has been prepared.

Commercial Solvents will use no consumer advertising for its Ajax and other anti-freeze products this fall, according to rumors in the advertising agencies.

With the Insecticide Makers

The Alton plant of the Ansbacher-Alton Chemical Co., destroyed by fire last winter, will be rebuilt. Company which makes agricultural sprays has been filling orders from other plants. The strike called by the C.I.O. at Tobacco By-Products' plant at Richmond, Va., has been settled.

Month's New Products

Included in the month's announcements of new industrial specialties were:—A new transfer remover, Laureltex No. 340, for use on silk hosiery for redyeing, by Laurel Soap, Philadelphia; Nopco Copping Oil No. 7 for conditioning fancy rayon and acetate yarns by National Oil Products, Harrison, N. J.; Flex-Tex printing lacquers for use on textiles, shower curtains, transparent umbrellas, etc., by Roxalin Flexible Lacquer, Elizabeth, N. J. The latter company also reports Buffing Lacquer No. 950 and Flexible Silver Lacquer No. 5985 as new additions to its line. Descriptions of these products will be sent to C. I. readers who apply directly to Roxalin Flexible Lacquer.

Colmonoy, Inc., Los Nietos, Calif., is introducing "Colmonoy Sweat-on Crystals" a paste, and used for producing a welded-on, wear-resistant, heat-resistant, corrosion resistant overlay or hard facing on metals.

Briefs on Specialty Makers

H. Kohnstamm & Co., old established firm in the laundry supplies and dye fields, has taken over space at 5735 District Blvd., Los Angeles. Pioneer Adhesives, Matawan, N. J., new producer of adhesives and owned by Zobel Chemical of Brooklyn, is now in production. Chemical Products, Tulsa, Okla., manufacturer of industrial detergents and specialties, is in larger quarters at 501 W. 1st st. National Chemical & Manufacturing, Chicago, is opening a Brooklyn plant at 25 Forrest st., Brooklyn, to produce "Luminall" a paste casein paint.

Maizo Mills, Inc., Columbus, Ohio, has been reorganized and will make metal polish and fur cleaning products from corn. Berman Chemical, which specializes in cleansers for the brewing field, is in larger quarters in Toledo at 535 E. Woodruff ave.

Brick Stain Co. of Iowa, manufacturing special stains for brick, has relocated manufacturing facilities at 949 Polk Blvd., Des Moines. Aqua-Sec Corp., manufacturer of a wide line of specialties, has taken new quarters at 1450 Broadway, N. Y. City. William H. Scott and Harold Heidt, both with the company for some time, have been made vice-presidents. Company has brought out "Smite" a new moth-repellent.

Hillyard Chemical, manufacturer of floor maintenance products, is moving to much larger quarters at 3rd and Faraon sts., St. Joseph, Mo. B. T. Babbitt, Inc., has purchased in a foreclosure procedure property once occupied by Albany Chemical, which later became the Witbeck Chemical Corp.

Hardening Asbestos-Cement

Surface of asbestos-cement products may be hardened by coarse grinding, then using a 10% solution of zinc silicofluoride and finally subjecting the surface to fine grinding, and if desired, to a polishing operation. English Patent 462,251. F. L. Smidth & Co. Aktieselskab, Germany. *Chemical Trade Journal*, June 18, p. 557.

New Paper Adhesive

A new adhesive for the paper trade, a cellulose product from wood, developed by an affiliate of the I. G., will be shown at the Leipzig Autumn Fair. Reported to be a perfect substitute for flour-paste, and to possess a number of other applications. *Chemical Trade Journal*, June 18, p. 552.

Formula For Casein-Silicate Glue

A casein-silicate adhesive is being used by the Russian Furniture Trust and is compounded as follows:—100 parts casein, 350 parts water, 15 parts sodium silicate, 10 parts slaked lime.

Nicotine From Tobacco Waste

A new process for the extraction of nicotine from tobacco waste for the production of fumigants, insecticides, and sheepdips is reported by the Nico-Brand Co., Quay Road, Whitehouse, Belfast, Ireland.

Chemical Specialty Patents

Cement for refractory uses, comprising heat treated recrystallized chromite, sodium silicate and periclase. No. 20,413. Reissue. Gilbert E. Seil, Cynwyd, Pa., to E. J. Lavino & Co., Phila, Pa.

Treatment oleaginous oils and fats of sp. gr. less than .970 by heating under diminished pressure to raise sp. gr. to about .975. No. 2,083,572. James McKee, Media, Pa., Susan M. McKee, administratrix of James McKee, deceased.

Abrasive article consisting of abrasive granules bonded together with a synthetic resin and lead oxide. No. 2,083,719. Jos. N. Kuzmick, Passaic, and Jerome Kuzmick, Clifton, N. J., to Raybestos-Manhattan, Inc., Passaic, N. J,

Relatively harmless, water rinsible detergent for removal glycerol phthalate synthetic resins and cellulose lacquer from the skin, consisting of: synthetic resin solvent matter, a highly volatile cellulose lacquer solvent, soap, glycerin, carbon tetrachloride, water, and an alkali. No. 2,083,821. Waldemar Blech, Cleveland, O., to Thurlow G. Gregory.

Manufacture filter element; using solution of a soluble crystalline compound in process. No. 2,083,865. George C. Rensink, Denver, Colo.

Wastepaper de-inking and de-fibering process and apparatus. No. 2,083,884. Harold Donald Wells, Glens Falls, N. Y.

Manufacture insulating plaster, capable of being plasticized with water. No. 2,083,961. Gustave Adolph New, New York City, to Thurlow G. Gregory.

Textile weighting composition consisting of an intimate dispersion of an amylaceous substance, urea, and water. No. 2,083,982. Herman S. Bosland, Paterson, N. J., to Stein, Hall & Co., Inc., New York City.

Tree band insecticide material including an absorbent medium impregnated with beta naphthol, beta naphthol tar, and an oil. No. 2,083,984. Guy H. Buchanan, Westfield, N. J., to American Cyanamid Co., New York City.

Production cooked varnish; comprising a drying oil and a condensation derivative of rubber. No. 2,084,020. Herbert A. Endres, Silver Lake, O., to Wingfoot Corp., Wilmington, Del.

Production cooked varnish; including a drying oil and an oxidized condensation derivative of rubber. No. 2,084,039. John A. Lutz, Akron, O., to Wingfoot Corp., Wilmington, Del.

Preparation bodied tung oil. No. 2,084,137. Theo. H. Geiger, New York City, and Lothian M. Burgess, Shrewsbury, Mass., to Tung Oil Products, Inc., Newark, N. J.

Production composite sheet consisting of an unfired, non-friable, hard and tough sheet-like refractory body comprising mixture of a hydraulic cement binder, asbestos, a foliated micaceous material, and a tempering agent. No. 2,084,232. Roger W. Williamson, Ruxton, and Guy Leonard, Balto., Md.

Manufacture cementitious insulating materials from vermiculite. No. 2,084,276. Paul S. Denning to F. E. Schundler & Co., Inc., and to Illinois Clay Products Co., all of Joliet, Ill.

Manufacture asbestos-cement products. No. 2,084,354: Giovanni Morbelli, Milan, Italy, to Frederick O. Anderegg, Forest Hills Boro, Pa.

Metal cleaning solution comprising water soluble acid esteric reaction product of a dehydrated phosphoric acid and an organic compound containing a primary alcohol group. No. 2,084,361. Byron M. Vanderbilt, Chicago Heights, Ill., to Victor Chemical Works, Chicago, Ill.

Brake fluid composition consisting of fusel alcohol and a triethanolamine. No. 2,084,404. Earl Bowman Millard, Newton, Mass., to Bendix Products Corp., So. Bend, Ind.

Manufacture soap and glycerin. No. 2,084,446. Henry W. F. Lorenz, Jersey City, N. J., forty per cent. to Chas. H. Wilson, New York City.

Operating liquid for fluid pressure apparatus; comprising oil which is inert to rubber, and a ketone alcohol. No. 2,084,482. Geo. L. Doelling to Wagner Electric Corp., both of St. Louis, Mo.

Improved dry cleaning composition; naphtha soluble soap. No. 2,084,483. Theo. R. Donlan, Irvington, N. J., to Standard Oil Development Co., corp. of Del.

Improved combined wood filler and stain, using colloidal silicic acid, commercial sodium silicate, a coloring material, and a solution of an acid salt of an alkali metal. No. 2,084,486. Earl D. Flood and John A. Hannum, Cleveland Heights, O., to Flood Co., corp. of Ohio.

Container-duster for insecticide powder. No. 2,084,493. Edward B. Hunn, Cranford, N. J., to Stanco, Inc.

Lubricating soap grease having incorporated therein an addition of a hydrocarbon product. No. 2,084,500. Michael Otto and Martin Mueller-Cunradi, Ludwigshafen-am-Rhine. Germany, to I. G., Frankfort-am-Main, Germany.

Spray gun with removable discharge tube. No. 2,084,505. Wm. H. Rose, Jersey City, N. J., to Stanco, Inc., corp. of Del.

Improved wetting agents and detergents from petroleum oils and products. No. 2,084,506. Raphael Rosen, Cranford, N. J., to Standard Oil Development Co., corp. of Del.

Patents digested include issues of the "Patent Gazette," June 15 through July 6 inclusive.

Abrasive wheel, comprising bonded abrasive material and having cementitious joints between the abrasive shapes composed of a hard rubber binder together with a finely divided inert filler. No. 2,084,513. Frank J. Tone to Carborundum Co., both of Niagara Falls, N. Y.

Preparation steam cylinder oil; mixing a hydrocarbon lubricating oil and its normally contained organic acids with alkaline earth metal oxide. No. 2,084,531. Arthur Lazar, Associated, and Jos. V. Crenna, Concord, Calif., to Associated Oil Co., San Francisco, Calif.

Preparation an emulsifiable oil suitable for use in cylinders of steam engines; comprising adding an alkaline earth metal soap of an organic acid normally present in petroleum to a hydrocarbon lubricating oil. No. 2,084,532. Arthur Lazar, Associated, and Jos. V. Crenna, Concord, Calif., to Associated Oil Co., San Francisco, Calif.

Manufacture resin bonded abrasive articles. No. 2,084,534. Harry C. Martin, Niagara Falls, N. Y., and Fred A. Upper, Niagara Falls, Ont., Canada, to Carborundum Co., Niagara Falls, N. Y.

Manufacture magnesia insulation product. No. 2,084,588. Lewis B. Miller, Plainfield, N. J., to Johns-Manville Corp., New York City.

Semi-fluid detergent in gel form, consisting of a water-soluble soap incorporated in a solvent consisting of hydrogenated petroleum naphtha. No. 2,084,632. Carleton Ellis, Montclair, N. J., to Standard-I. G. Co.

Abrasive bite-rim composition, comprising gum damar, beeswax, gum tragacanth, French chalk, and abrasive material. No. 2,084,644. Jason D. Kinsley, Cedar Rapids, Iowa.

Composition for use in hydrogenating oils; comprising mixture of oil and finely divided dehydrated nickel formate. No. 2,084,687. Holger B. Jesperson, Mountain Lakes, N. J. to Hanson-Van Winkle-Munning Co., Matawan, N. J.

Silver-containing solder for joining rustless or stainless iron or steel alloys, consisting of silver, manganese, and copper. No. 2,084,928. Harold Turner, Sheffield, England, to Johnson Matthey & Co., Ltd., London, England.

A gilsonite-drying oil varnish highly pigmented with carbon black, containing a saturated aliphatic monohydric alcohol. No. 2,084,933. Alfonso M. Alvarado to du Pont, both of Wilmington, Del.

Process treating Portland cement with steam. No. 2,085,044. Paul S. Roller, Stelton, N. J.

Manufacture abrasive articles which contain granular abrasive material, bond, and granulated coke. No. 2,085,137. Chas. E. Wooddell and John F. Barnes, to Carborundum Co., all of Niagara Falls, N. Y.

Treatment psorosis in citrus trees, preparation comprising dilute aqueous mixture of lye, Lysol, and potassium permanganate. No. 2,085,210. Engle A. Boele, Pasadena, Calif.

Germicidal preparation comprising an alkyl substituted derivative of tertiary butyl phenol and a phenolic body having germicidal properties. No. 2,085,318. Emil Klarmann to Lehn & Fink Products Corp., both of Bloomfield, N. J.

Detergent composition comprising mahogany sulfonates, fatty acid soap, and a water soluble alkali. No. 2,085,471. Warren T. Reddish to Emery Industries, Inc., both of Cincinnati, O.

Chewing gum composition; using polyvinyl ester in process. No. 2,085,490. Kenneth G. Blaikie, Shawinigan Falls, Que., Canada, to Shawinigan Chemicals, Ltd., Montreal, Que., Canada.

Rubberized soap for manufacturing lubricating greases. No. 2,085,534. Edwin N. Klemgard, Martinez, Calif., to Shell Development Co., San Francisco, Calif.

Backing paint for floor covering material; comprising pigment, rubber latex, casein, borax, and ammonia. No. 2,085,602. Robt. Holmes Pohl, Upper Darby, Pa., to Sloane-Blabon Corp., Phila., Pa.

Manufacture asbestos-cement agglomerate. No. 2,085,640. Louis Czajko, Antwerp, Belgium.

Manufacture solvents by fermentation of a carbohydrate mash. No. 2,085,666. James F. Loughlin, Milwaukee, Wis.

Detergent, an alkali soap; using sodium carbonate and liquefied fatty acids in process. No. 2,085,691. Alex C. Brown, Mt. Healthy, O., to Emery Industries, Inc., Cincinnati, O.

Manufacture abrasive wheel. No. 2,085,705. Baalis Sanford and Duane E. Webster to Norton Co., all of Worcester, Mass.

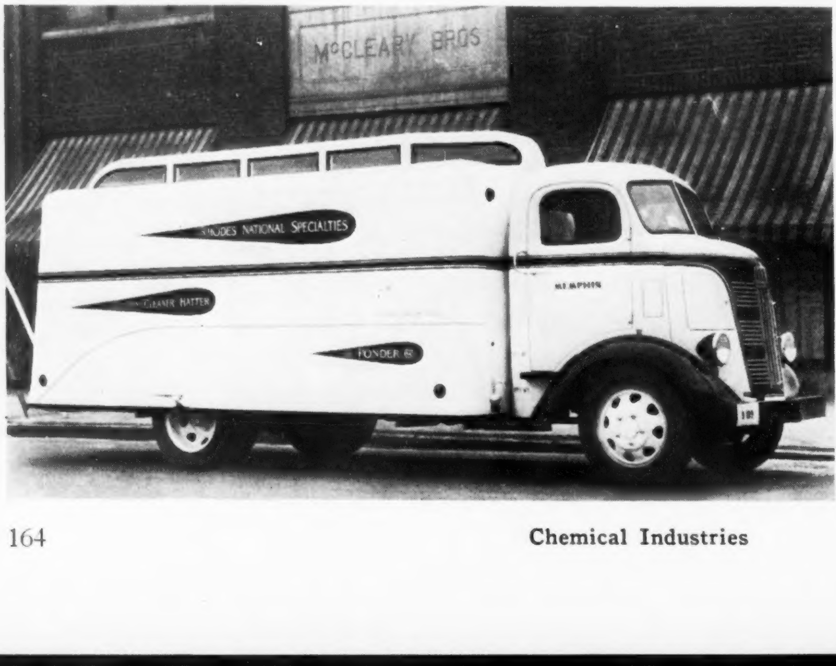
Composition for reducing or preventing foam; liquid mixture of a solid aliphatic alcohol and a liquid aliphatic alcohol. No. 2,085,709. Werner Steibelt, deceased, late of Ludwigshafen-am-Rhine, Germany, by Elisabetha Steibelt, administratrix, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Manufacture light-weight material. No. 2,085,793. Harold T. Coss, Somerville, N. J., to Johns-Manville Corp., New York City.

Embalming fluid composed of formaldehyde, an ionizable aluminum salt, and a germicidal agent. No. 2,085,806. Hilton Ira Jones, Wilmette, Ill., to Naselmo Corp., Chicago, Ill.

Composition for use in moistureproofing non-fibrous, transparent, cellulosic sheets or films comprising a hydrorosinate, a wax material, and a cellulose derivative. No. 2,085,816. Fred M. Meigs, to du Pont, both of Wilmington, Del.

Method forming soap. No. 2,085,840. Chas. T. Walter to Industrial Patents Corp., both of Chicago, Ill.



Demonstration truck used by McCleary Bros., Memphis, Tenn., to display machinery items which they manufacture and sell to the laundry and dry cleaning trade. The car itself is of special design with ample head room for the average person to stand erect, there is a center aisle, and equipment is displayed on both sides. It is equipped to carry a steam boiler in order that hat equipment may be demonstrated.

PURE
372,991

BLACK ALUM
375,112

DATEX
The
DATEDPAC
376,372

REZITE
378,083

379,523

W. C. L.
STIXTITE
374,005

NOPCO
381,465

CELL-O-SILVER
383,164

HOFFMAN
VALV-KLEAN
383,529

Duxbak
TRADE MARK
384,061

ISOLINE
384,684

SEALDRITE
IMPERVIOUS TO WATER
384,943

AMAYOL
385,482

MARVATEX
385,790

WHITE CRAFT SYSTEM
386,038

Sani-Grow
386,435

Skree-o
386,565

UROMAT
386,605

MIGAMAT
386,606

KEYSTONE
CARBONATE of AMMONIA
386,715

SANTOMERSE
387,090

MOTH DRUM
387,170

INVADERM
387,216

REXIDE
388,331

NEW
MAGIC
388,651

APOLLO
389,017

ENVOY
388,018

SENECA
389,022

STADIUM
389,023

DRAINADE
389,207

MOTOR-KOOL
389,222

DETERGINE
389,349

Rolyan
PRODUCTS
389,369

DAYSHINE
389,726

PESTOWAY
389,747

NELIO
389,821

RAIN-COTE
389,842

PEMCO
UNIFORM
PERFORMANCE
389,885

372,991. Pure Oil Co., Chicago, Ill.; Dec. 23, '35; automobile top sealer, chemically treated automobile polishing, cleaning, and dusting cloths, cleaning preparations for glass and windshields, etc.; use since Feb. 5, '35.

373,462. Oster Mfg. Co., Cleveland, O.; Jan. 8, '36; thread cutting oil; use since Oct. 10, 1920.

375,112. Activated Alum Corp., New York City; Feb. 24, '36; coagulant; use since Dec. 15, '32.

376,372. Michael M. Baig, Montreal, Canada; Mar. 25, '36; rubber, gutta percha, and cellulose; use since Jan. 19, '35.

378,083. I. F. Laucks, Inc., Seattle, Wash.; May 6, '36; under or priming coat for wood, cement, plaster, or brick, and filler, sealer, and grain raising inhibitor for lumber and plywood; use since Apr. 24, '36.

379,523. S. C. Johnson & Son, Inc., Racine, Wis.; June 10, '36; liquid wax polish; use since Feb. 20, '35.

374,005. Wm. C. Lindahl (W. C. Lindahl), Chicago, Ill.; Jan. 23, '36; liquid cement; use since Mar. 1, '35.

381,465. National Oil Products Co., Harrison, N. J.; July 25, '36; various chemical specialties, oils, and fatty acids; use since Jan. 24, '28.

383,164. Gemloid Corp., New York City; Sept. 12, '36; cellulosic derivative product having metallic silver coating; use since Mar. 1, '35.

383,529. Hoffman Specialty Co., Waterbury, Conn.; Sept. 23, '36; compositions used in preparing solutions for cleaning radiator air valves, etc.; use since Aug. 21, '36.

384,061. Utica Duxbak Corp., Utica, N. Y.; Oct. 6, '36; waterproofing solution for fabrics, particularly tents, boat covers, etc.; use since May 1, '36.

384,684. Woburn Degreasing Co. of N. J.; Kearney, N. J.; Oct. 16, '36; drying oils for paints and varnishes; use since Dec. 19, '35.

384,943. M & M Wood Working Co., Portland; Ore.; Oct. 26, '36; waterproof laminated wood; use since Sept. 1, '36.

385,432. Andrew Amaya, San Antonio, Tex.; Nov. 12, '36; finish for varnished, Ducoed, lacquered, or enameled surfaces; use since Nov. 12, '35.

385,790. Paul C. Haas, Mendon, Mich.; Nov. 20, '36; synthetic resinous and fibrous materials; use since Nov. 4, '36.

386,038. G. J. Liebich Co., Chicago, Ill.; Nov. 27, '36; paints, enamels, lacquers, varnishes, stains, and primers; use since Nov. 1, '35.

386,435. Sisto E. Marsico (Delafield Nurseries), Aspinwall, Pa.; Dec. 7, '36; insecticide; use since Oct. 1, '36.

386,565. Raymond A. Willis (Willis Products), Brooklyn, N. Y.; Dec. 4, '36; insect exterminator and insecticide; use since Oct. 1, '36.

386,605. Society of Chemical Industry in Basle, Basel, Switzerland; Dec. 10, '36; textile auxiliary agents; use since Apr. 18, '35.

386,606. Society of Chemical Industry in Basle, Basel, Switzerland; Dec. 10, '36; textile auxiliary agents; use since Apr. 18, '35.

386,715. American Agricultural Chemical Co., New York City; Dec. 14, '36; carbonate of ammonia; use since Jan. 1, '34.

387,090. Monsanto Chemical Co., St. Louis, Mo.; Dec. 23, '36; wetting, spreading, emulsifying, dispersing and penetrating agents; use since Dec. 15, '36.

387,170. Bloomingdale Bros., Inc., New York City; Dec. 28, '36; moth preparations; use since Sept. 26, '36.

387,216. Society of Chemical Industry in Basle, Basel, Switzerland; chemical products for treatment textiles and leather; use since Nov. 22, '33.

388,331. Rexair, Inc., Detroit, Mich.; Jan. 29, '37; mothproofing preparation; use since Jan. 20, '37.

388,651. C. & E. Marshall Co., Chicago, Ill.; Feb. 8, '37; watch cleaning solutions; use since Apr. '36.

389,017. Globe Roofing Products Co., Inc., Chicago, Ill.; Feb. 17, '37; asphalt composition roofing and building papers; use since Feb. 8, '37.

389,018. Globe Roofing Products Co., Inc.; Chicago, Ill.; Feb. 17, '37; asphalt composition roofing and building papers; use since Feb. 8, '37.

389,022. Globe Roofing Products Co., Inc., Chicago, Ill.; Feb. 17, '37; asphalt composition roofing and building papers; use since Feb. 8, '37.

389,023. Globe Roofing Products Co., Inc., Chicago, Ill.; Feb. 17, '37; asphalt composition roofing and building papers; use since Feb. 8, '37.

389,207. Whitlock Chemical Co., Springfield, Ill.; Feb. 20, '37; preparation for opening and cleaning drains; use since July 1, '35.

389,222. Carl A. Albrecht, Columbus, O.; Feb. 23, '37; flushing compound for cooling systems of internal combustion engines; use since Jan. 2, '37.

389,349. Benjamin L. Duryea, New York City; Feb. 25, '37; detergent and cleansing fluid for household and industrial use, which may also be used as insect repellent; use since May 1, 1900.

389,369. Fred D. Naylor, Groton, Mass.; Feb. 25, '37; poison ivy killer, insecticide, preparation to prevent runs in hosiery, raticide, etc.; use since June 3, '36.

389,726. E. L. and J. F. Dennehy, Inc., Brockton, Mass., and Johnson City, N. Y.; Mar. 6, '37; leather and shoe finishes, e. g., blackings, etc.; use since Mar. 1, '22.

389,747. Pest-O-Way Exterminating Co., Balto., Md.; Mar. 6, '37; insect powder; use since Sept. 15, '36.

389,821. Glidden Co., Cleveland, O.; Mar. 9, '37; turpentine; use since Aug. 17, '34.

389,842. Metropolitan Roofing Supplies Co., Inc.; New York City; Mar. 9, '37; plastic fibrous cement; use since Apr. 3, '36.

389,885. Porcelain Enamel & Mfg. Co. of Balto., Balto., Md.; Mar. 10, '37; enamel frits, oxides, and opacifiers; use since Feb. 24, '37.

† Trade-marks reproduced and described cover those appearing in the *U. S. Patent Gazettes*, June 15 to July 6.

ALKALI PROOF
390,060

BLACK FLAG
390,260

SPECTRACEM
390,406

ATOZ
390,500

TRI-PHOS
390,567

"HI-HO"
HEIGH-HO
390,662

SILVER ARROW
390,694

CO-OP
390,813

COALDRES
390,836

TOPS
390,842

PERMA-BRITE
390,818

CHILLO
390,835

BARTYL
390,850

Lithochrome
390,869

AMERCOAT
390,883

HELIOGEN
391,004

SPEEDY PRE-SPOTTER

ILI
391,057

PERMA-NU
391,061

SAFE TO USE
Ripley's
391,072

Waterman's
391,099

GLEEM
391,112

MILKOPINE
391,198

FABRIXAID
391,213

LAUX REZ
391,221

SNOBOY
MAKES CLOTHES WHITE
391,237

CARBONTROLED
388,867

VISCOSENE
391,256

PARAFLUSH
391,300

SERO-COTE
391,352

SOLATINE
391,356

LIQUID SNOW
391,387

KINOLITE
391,400

TELLITE
391,401

Butesso
391,403

PYRAMID
391,423

HI-PEAK
391,431

PLIASTONE
391,454

DOLESCO
391,465

ELCO
391,523

KLARENE
391,540

BOULDER CANYON
391,556

390,060. Fuld Bros., Balto., Md.; Mar. 15, '37; detergents; use since Sept. 1936.

390,260. Black Flag Co., Balto., Md.; Mar. 19, '37; insecticides; use since Feb. 20, '37.

390,406. Binney & Smith Co., New York City; Mar. 23, '37; carbon black for cement industry; use since Mar. 11, '37.

390,500. John Guy Britton, Lansdowne, Pa.; Mar. 25, '37; plastic material; use since Oct. 4, '36.

390,567. Tex-Ite Products Co., Brooklyn, N. Y.; Mar. 26, '37; industrial, household and dry cleaning compounds; use since Aug. 24, '24.

390,662. Ohio Oil Co., Findlay, O.; Mar. 29, '37; fly sprays; use since Mar. 24, '37.

390,694. H. B. Davis Co., Baltimore, Md.; Mar. 30, '37; paints, enamels, lacquers, and varnishes; use since June 6, '34.

390,813. Sherwin-Williams Co., Cleveland, O.; Apr. 1, '37; insecticides, dyes, pigment colors, germicides, vermicides, etc.; use since Jan. 15, '37.

390,836. Cities Service Oil Co., Chicago, Ill.; Apr. 2, '37; oil to prevent coal from dusting; use since Sept., '34.

390,842. Derris, Inc., New York City; Apr. 2, '37; insecticides and drain pipe cleaner; use since Mar. 10, '37.

390,818. Sherwin-Williams Co., Cleveland, O.; Apr. 1, '37; paints, enamels, lacquers, Japans, varnishes, stains, fillers, kalsomine, water paints, etc.; use since Feb. 5, '37.

390,835. Cities Service Oil Co., Dover, Del., and Chicago, Ill.; April 2, '37; cutting oil; use since April, '27.

390,850. Givaudan-Delawanna, Inc., New York City; Apr. 2, '37; anti-skinning agent for paints and varnishes in their containers; use since Feb. 1, '37.

390,869. Lynn M. Scofield (L. M. Scofield Co.), Huntington Park, Calif.; Apr. 2, '37; wax for preservation and maintenance of surfaces; use since '27.

390,883. American Concrete & Steel Pipe Co., Los Angeles, Calif.; Apr. 2, '37; cementitious acidproofing material for lining or coating steel pipes, etc.; use since Jan. 1, '36.

391,004. General Dyestuff Corp., New York City; Apr. 6, '37; pigment dyestuffs; use since Jan. 10, '36.

391,051. Chemical Products, Savannah, Ga.; Apr. 8, '37; general cleaning preparation; use since Feb. 15, '37.

391,061. Emulsion Products Co., Inc., Los Angeles, Cal.; Apr. 8, '37; compound for stainproofing wash fabrics and rendering them water repellent; use since Oct. 27, '36.

391,072. Louis B. Kang (Ripley Products Co.), Los Angeles, Calif.; Apr. 8, '37; general cleanser; use since Dec. 28, '36.

391,099. L. E. Waterman Co., New York City; Apr. 8, '37; writing ink; use since Feb. 1, '36.

391,112. Claire Mfg. Co., Chicago, Ill.; Apr. 9, '37; deodorant and disinfectant, having cleansing properties; use since Sept. 1, '36.

391,198. West Disinfecting Co., Long Island City, N. Y.; Apr. 10, '37; deodorant and antiseptic spray for overcoming disagreeable odors; use since Jan. 21, '37.

391,213. Hiram Goldstein (Utility Products Co.), Buffalo, N. Y.; Apr. 12, '37; fluid for general cleaning purposes; use since Apr. 3, '37.

391,221. I. F. Laucks, Inc., Seattle, Wash.; May 3, '37; under or priming coat for wood, cement, plaster or brick, and for a filler, sealer, and grain raising inhibitor for lumber and plywood; use since Apr. 21, '37.

391,237. Abraham F. Moore (A. F. Moore & Co.), Worcester, Mass.; Apr. 12, '37; ammonia, liquid bluing, and for bleaching, cleansing and softening water; use since Dec., '36.

388,867. Lubri-Zol Corp., Cleveland and Wickliffe, O.; Feb. 13, '37; motor fuel addition agents; use since Feb. 2, '37.

391,256. Soluol Corp., Providence, R. I.; Apr. 10, '37; wetting out and/or dyeing agents, and dye solvents; use since Jan. 5, '37.

391,300. Paragon Oil Co., Inc., Brooklyn, N. Y.; Apr. 14, '37; lubricating oils and greases; use since Aug. 10, '33.

391,352. Sears, Roebuck & Co., Chicago, Ill.; Apr. 14, '37; ready mixed paints; use since Jan. 22, '36.

391,356. Stein, Hall & Co., Inc., New York City; Apr. 14, '37; sodium lactate solution; use since Aug. 9, '35.

391,387. Klinzmoth Chemical Corp., New York City; Apr. 15, '37; insecticide; use since '34.

391,400. RCA Mfg. Co., Inc., Camden and Harrison, N. J.; Apr. 15, '37; fluorescent material for use in cathode ray tubes; use since Mar. 29, '37.

391,401. RCA Mfg. Co., Camden and Harrison, N. J.; Apr. 15, '37; fluorescent material for cathode ray tubes; use since Mar. 29, '37.

391,403. Standard Oil Co. of N. J.; Wilmington, Del.; Apr. 15, '37; hydrocarbon gases for industrial and commercial purposes; use since Mar. 23, '37.

391,423. John W. Hawkshaw (Pyramid Oil Co.), Washington, D. C.; Apr. 16, '37; motor lubricating oils, grease, and gasoline; use since Sept. 19, '36.

391,431. Mountain State Oil & Supply Co., Huntington, W. Va.; Apr. 16, '37; lubricating oils and greases; use since Nov. 15, '36.

391,454. Andresen Corp., Chicago, Ill.; Apr. 17, '37; bituminous road construction material; use since Feb. 1, '37.

391,465. Dolese & Shepard Co., Chicago, Ill.; Apr. 17, '37; pulverized dolomite; use since Aug. 12, '36.

391,523. Elco Grease & Oil Co., Cleveland, O.; Apr. 19, '37; lubricating oils and greases; use since Jan. 6, '23.

391,540. Midland Chemical Labs., Inc., Dubuque, Iowa; Apr. 19, '37; dry cleaning aid to be added to stock solution; use since Mar. 3, '37.

391,556. U. S. Lime Products Corp., San Francisco, Calif.; Apr. 19, '37; hydrated lime and prepared plaster; use since Apr. 5, '28.

391,577. Lion Oil Refining Co., Eldorado, Ark.; Apr. 20, '37; lubricating oils; use since Feb. 25, '37.

LION
391,577

RELIANCE
391,589

USE
RELIANCE
BRANDS
391,590

Cardinal
391,621

SILVER
BOND
391,622

UNISORB
391,632

VEG-RO-SUL
391,636

CHEMI-SKIN
391,648

BITUGLOSS
391,666

CHROMASTIC
391,667

THERMASTIC
391,668

L-T-Z
391,708

LYCONS
391,735

"DURABOND"
391,777

RED
CROWN
391,799

TRAIL
BLAZER
391,841

MONSATIN
391,869

Foliafume
391,925

PARK COLOR
392,122

PARK LIGHT
392,123

PARK WOOD
392,124

McNAMARA
392,158

Superfoam
392,180

REZEAL
392,222

REZITER
392,223

REZATE
392,224

ECCOLENE
392,261

INSULWOOL
392,363

AMYLOXIN
392,388

Heatclik
392,401

LUCITE
392,416

No.3
392,454

No.7
392,455

COPPERSEAL
392,461

ACETAMINE
392,476

CATALITE
392,477

PONTAGEN
392,478

HYDRON
392,483

ALPHANOL
392,486

GLYEZINE
392,489

ALL AMERICAN
392,865

TIDE WATER ASSOCIATED OIL COMPANY NEW YORK
392,871

RIP-N-STRIP
393,227

FILCOTONE
393,265

391,589. Reliance Fertilizer Co., Savannah, Ga., Apr. 20, '37, fertilizer; use since 1910.

391,590. Reliance Fertilizer Co., Savannah, Ga., Apr. 20, '37, fertilizer; use since 1910.

391,621. Cardinal Paint Corp., St. Louis, Mo.; Apr. 21, '37; paints, varnish, and paint enamels; use since Feb. 15, '37.

391,622. Cardinal Paint Corp., St. Louis, Mo.; Apr. 21, '37; paints, varnish and enamels; use since Feb. 15, '37.

391,632. Felters Co., Boston, Mass.; Apr. 21, '37; vibration absorbing materials for acoustic, mechanical insulating, etc., purposes; use since Apr. 15, '37.

391,636. General Chemical Co., New York City; Apr. 21, '37; insecticides and preparations for control of plant pests; use since Mar. 11, '37.

391,648. Metro Oil, Inc., St. Louis, Mo.; Apr. 21, '37; adherent material for protecting skin against dyes, oils, greases, pigments, and other irritating substances; use since Mar. 15, '36.

391,666. Wailes-Dove-Hermiston Corp., New York City; Apr. 21, '37; paint enamel; use since Apr. 6, '37.

391,667. Wailes-Dove-Hermiston Corp., New York City; Apr. 21, '37; paints, metal primers and pigmented varnishes; use since Apr. 6, '37.

391,668. Wailes-Dove-Hermiston Corp., New York City; Apr. 21, '37; paints; use since Apr. 6, '37.

391,708. National Lead Co., San Francisco, Calif., and New York City; Apr. 22, '37; paste paint; use since Sept. 1, '30.

391,735. B. T. Babbitt, Inc., New York City; Apr. 23, '37; lye; use since Apr. 1, '37.

391,777. Scholler Bros., Inc., Phila., Pa.; Apr. 23, '37; textile treating composition; use since Apr. 14, '37.

391,799. Boyer Chemical Lab. Co., Inc., (Boyer Chemical Works), Chicago, Ill.; Apr. 24, '37; scouring powder; use since Mar. 2, '37.

391,841. Geo. Worthington Co., Cleveland, O.; Apr. 24, '37; friction and rubber tapes, metal and rubber cements; use since Sept. 1, '36.

391,869. J. R. M. Klotz, Montclair, N. J.; Apr. 26, '37; resinous composition; use since Feb. 17, '37.

391,925. S. B. Penick & Co., New York City; Apr. 27, '37; plant insecticide; use since '29.

392,122. Parkwood Corp., Winchester, Mass.; Apr. 29, '37; material closely woven wooden veneer covered with plastic containing pigment; use since Apr. 3, '37.

392,123. Parkwood Corp., Winchester, Mass.; Apr. 29, '37; material of open spaced woven wooden veneer covered with transparent plastic; use since Apr. 3, '37.

392,124. Parkwood Corp., Winchester, Mass.; Apr. 29, '37; material of closely woven wooden veneer covered with transparent plastic; use since Apr. 3, '37.

392,158. Michael McNamara Varnish Works, Inc., Detroit, Mich.; May 1, '37; paints and varnishes; use since 1882.

392,180. W. A. McCall (McCall Merchandising Co.), Cincinnati, O.; May 4, '37; rug, tapestry, and fabric cleaner; use since Sept. 24, '34.

392,222. I. F. Laucks, Inc., Seattle, Wash.; May 3, '37; paints, etc.; use since Apr. 17, '37.

392,223. I. F. Laucks, Inc., Seattle, Wash.; May 3, '37; under or priming coat for wood, cement, plaster or brick, and for a filler, sealer, and grain raising inhibitor for lumber and plywood; use since Apr. 22, '37.

392,224. I. F. Laucks, Inc., Seattle, Wash.; May 3, '37; paints, etc.; use since Apr. 21, '37.

392,261. Harry D. Cummins, Pasadena, Calif.; May 4, '37; furniture stain remover; use since Apr. 5, '37.

392,363. Insul-Wool Insulation Corp., Wichita, Kans.; May 6, '37; thermal insulating material made from paper; use since Jan. 18, '37.

392,388. Norwich Pharmacal Co., Norwich, N. Y.; May 6, '37; preventive decomposition odors; use since Apr. 6, '37.

392,401. California Ink Co. of N. Y., Inc., New York City; May 5, '37; printing inks and printing ink vehicles; use since Dec. 8, '36.

392,416. E. I. du Pont de Nemours & Co., Wilmington, Del.; May 7, '37; synthetic resin; use since Feb. 4, '37.

392,454. Smooth-On Mfg. Co., Jersey City, N. J.; May 7, '37; iron cement in paste form; use since '08.

392,455. Smooth-On Mfg. Co., Jersey City, N. J.; May 7, '37; hydraulic iron cement; use since '12.

392,461. Vita-Var Corp., Newark, N. J.; May 7, '37; ready mixed paints; use since Nov. 7, '35.

329,476 E. I. duPont de Nemours & Co., Inc., Wilmington, Del.; May 8, '37; dyestuffs; use since June 19, '36.

392,477. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.; May 8, '37; anthraquinone compound; use since Oct. 30, '19.

392,478. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.; May 8, '37; dyestuffs; use since Jan. 17, '34.

392,483. General Dyestuff Corp., New York City; May 8, '37; dyes and dyestuffs; use since July 22, '25.

392,486. General Dyestuff Corp., New York City; May 8, '37; dyes and dyestuffs; use since Apr. 23, '27.

392,489. General Dyestuff Corp., New York City; May 8, '37; solvent for dyes; use since Apr. 17, '28.

392,865. Hillyard Chemical Co., St. Louis, Mo.; May 17, '37; varnish; use since May 1, '37.

392,871. Tide Water Associated Oil Co., New York City; May 14, '37; gasoline, lubricating oils and greases; use since Nov. 30, '36.

393,227. Norfolk Paint & Varnish Co., Quincy and No. Quincy, Mass.; May 25, '37; paints; use since June 1, '35.

393,265. Glidden Co., Cleveland, O.; May 26, '37; paste wood filler and stain; use since May 4, '37.

CHEMICAL

NEWS & MARKETS

George Cooper, new vice-president in charge of sales, Diamond Alkali

for water repellency

WATERPROOF W-559

WATERPROOF W-559 makes a stable milky emulsion which gives exceptional results on all fibres—cotton, wool, rayon or silk.

For spot, rain, splash or shower-proofing—in a single bath process—Waterproof W-559 meets the most rigid requirements. Discard the two-bath method—save time—and be assured of better and more consistent results.

Waterproof W-559 is a finely adjusted product which will remain stable for an extended period. In liquid form it is easy to dilute and convenient to handle.

FOR COTTON PRINTERS:

STEAM BLACK S-193 A
for a full violet shade of black

STEAM BLACK H. P. JET
for a deep jet black

For smooth, unmottled printed effects:

ALIZARENE YELLOW R
for reddish orange shades

ALIZARENE YELLOW G. N.
for a fast lemon shade

JACQUES WOLF & CO.

MANUFACTURING CHEMISTS AND IMPORTERS . . . PASSAIC, NEW JERSEY

Warehouses: **Providence, R. I.; Philadelphia, Pa.; Utica, N.Y.; Chicago, Ill.; Greenville, S. C.; Chattanooga, Tenn.**

IMPROVED LABOR OUTLOOK

Dow Workers Form Midland Chemical Workers' Association, Independent Organization Incorporated Under Michigan Laws—U. S. I.'s Baltimore Plant Employees Set Up Similar Bargaining Agency—Other Labor News of the Month—

Several chemical companies are finding a peaceful way out of possible labor troubles with the formation by their employees of independent associations. Willard H. Dow, president of Dow Chemical, in his annual message to stockholders reveals how such a plan is operating. He states:

"During the past 6 months, our employees have organized themselves into what is known as the Midland Chemical Workers' Association, an organization en-

PRESIDENT WILLARD H. DOW

Reports a workable plan for management-labor relations

tirely independent of the management of the company and developed independently by the workmen. It is a non-profit organization, incorporated under the laws of the State of Michigan and governed accordingly. We have entered into an agreement with this association and believe we have a most satisfactory method of working out any difficulties that may arise.

"The association represents a large percentage of the workmen of the plant; at the time of this writing, approximately 90% of the total workmen are members. The minimum rate for employment in our plant is 60c an hour and the average hourly paid earnings of all employees in the plant is 90.4c. The average yearly earning is $1,880, plus profit sharing of approximately $70 per man, thus indicating one of the highest paid groups of workmen in the country. In addition to the high rate of pay and the benefit obtained by the Social Security Laws, it was early realized that some consideration should be given the older men in our organization, who had been with us for a number of years and who were not of an age to participate in the social security benefits. As a result of this a paid up annuity for the benefit of these men was taken out with the Aetna Life Insurance Co., at a total cost to the Dow Chemical Co. of $311,851. This is a non-recurring expense and can be regarded as a cost equivalent to 33c per share on the common stock."

Takes Out a Maryland Charter

Employees of U. S. I.'s Baltimore plant have organized themselves as the U. S. Industrial Alcohol Employees' Association, Inc., and a Maryland charter has been taken out.

Solvay Workers' Council Seeks Members

V. A. Peringer, former temporary secretary of the Solvay Workers Council, on July 17th emphatically denied charges had been brought against the council under the Wagner Labor Relations Act. He quoted Bennett F. Schauffler, regional director of the National Labor Relations Board, as saying it is impossible to make charges against a labor organization.

Officers of the United Chemical Workers Industrial Union, local No. 164, a C.I.O. affiliate, state that the union had brought charges of violating the Wagner Act against the Solvay Workers Council and forecast an election would be held at Solvay's Hopewell plant to determine the bargaining agency.

Both organizations claim a majority of the hourly employees and the Workers Council has been recognized by the company.

Meanwhile, A. M. Smith, newly elected chairman of the Solvay Workers Council, announced appointment of the following membership committeemen: W. H. LeBas, ammonia and gas operators; H. G. Myers, end products operators; J. W. Thomas, ammonia side mechanics; R. F. Whitehurst, nitrate mechanics and machine shop; K. E. Booth, electrical; O. S. McDaniel, power; C. E. Logan, pipefitters, painters, insulators and carpenters; J. A. Finley, chemical; A. A. Atwater, police, office and stores and G. S. Felty, transportation and labor. The duties of the committeemen will be to solicit new members and to collect dues.

Seek Vote at Calco Plant

Calcocraft, an independent vertical labor union organized by employees of Calco Chemical has applied to the National Labor Relations Board for an election to determine which agency shall represent the employees in collective bargaining.

Decision lies between the independent union and the American Federation of Labor, with each group claiming a majority of the 1,900 employes eligible to vote.

Biddle Will Appeal F.T.C. Order

Case Will Provide Test of Provisions of the Robinson-Patman Act and May More Clearly Define Certain Ambiguities in the Law—

Biddle Purchasing has announced that it will take an immediate appeal to the U. S. Circuit Court of Appeals of the cease and desist order of the Federal Trade Commission directing the company to abandon its policy of brokerage fees. Thus the first decision of the F.T.C. interpreting the Robinson-Patman Act will reach the courts within a short period of time. Case has been given tremendous publicity and the appeal will be watched by executives with keenest interest.

In this case the Commission found that the Biddle Company acted as the agent and representative of the buyers in transactions with the sellers and not as agent of the sellers. Sellers paid to Biddle brokerage fees or commissions on goods sold through Biddle to its buyer-clients. These commissions were passed along by Biddle to the buyers, and, according to the Commission, in effect were actually paid by the seller to the buyer, which resulted in giving the buyer a discount in price. Commission decided that, if any services were rendered by the Biddle Company to the sellers, no payment was in fact made for such services, but that brokerage was paid for use of the buyers exclusively. According to the findings of the Commission, the methods used by the respondents were part of a general scheme or plan whereby brokerage fees were paid by the seller to the buyer which enabled the buyers to secure discounts in price from the sellers under the guise of brokerage fees, in violation of the Act. The Commission's order requires the sellers to discontinue paying to the Biddle Company any brokerage commission intended to be paid over by Biddle to any purchaser of such commodities. The buyers are ordered to cease accepting from the Biddle Company any brokerage commission paid to it by a seller on sales made by such seller to the buyers. The Biddle Company is directed to cease and desist from receiving from any seller any brokerage commissions intended to be paid over to the buyer or to be applied for his use in benefit.

It is evident, because of certain ambiguities in the law itself, that the Biddle case has taken on the status of a test case and that on the interpretation ultimately given by the courts rests the fate of the effectiveness of the Robinson-Patman Act.

Alcohol Makers Using Blackstrap Fight Proposed Tax

Amendment to Sugar Quota Bill Would Add 7½c a gal. to Cost, Producers Claim—Paint Industry Joins in Opposition—Hercules to Make Stock Offering—

Manufacturers of alcohol from blackstrap molasses and users of this important solvent are actively fighting a little noticed amendment inserted in the compromise sugar quota bill immediately before it was approved by the House Agriculture Committee.

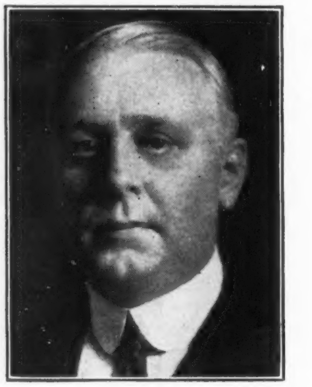
Amendment, offered by Rep. Lucas, (Ill. Dem.), is designed to benefit grain producers by imposing the proposed ½c per lb. sugar processing tax upon liquid sugar used in the manufacture of alcohol.

Trade quarters state the said effect of this amendment would be to levy a 3c a gallon excise tax upon inedible blackstrap molasses used in the manufacture of industrial alcohol.

The tax on blackstrap molasses, it was estimated, would increase this cost by more than 7½c per gallon.

Both manufacturers and consumers of industrial alcohol are preparing to make a fight to have this amendment dropped from the bill when it reaches the House floor. They contend that it would not benefit the producers of grain, but would encourage the production of synthetic alcohol, such as methyl and ethyl.

Ernest T. Trigg, president, National, Paint, Varnish & Lacquer Association, has taken the position that enactment of the Lucas amendment "would increase the cost of industrial alcohol tremendously." He states that his industry will make every effort to have the proviso dropped from the bill.



ERNEST T. TRIGG

N. P. V. & L. A. president joins in fight against tax on blackstrap for use in alcohol production

Fate of the proposed sugar quota bill is very much in doubt. In the past few days it appeared that the measure would fail to get anywhere, and that instead, a resolution continuing the present Jones-Costigan law for a year beyond the present expiration date of Dec. 31st would be put through. However, President Roosevelt is said to have indicated that it is desirable that new sugar legislation be passed before adjournment. Despite this boost from the president the measure is expected to fail, largely for the reason that proponents of such legislation cannot agree among themselves on the form that such a measure should take.

Hercules Issues Rights

Hercules is offering stockholders the right to subscribe to new common stock at $75 a share in the ratio of one new share for each 10 now held. Rights will accrue to stockholders of record Sept. 14th and must be exercised by Oct. 14th.

Since there are now outstanding 606,234 shares of common stock, approximately 60,623 shares will be offered under the proposed plan providing about $4,500,000 in new capital. At a price of around 160 for the stock, rights will have a value of about $7.70 each.

Purpose of the new financing is to provide additional working capital and plant expansion for the company's rapidly growing business. In the 1936 annual report it was stated, "The substantial increase in business during the year required increased working capital and plant investment. This coupled with the payment of a large proportion of earnings in dividends, resulted in a considerable reduction in the company's cash and securities. Furthermore, prospects are for continued substantial construction expenditures and additional working capital requirements in 1937."

Chemical Exposition Plans

Plans for the Exposition of Chemical Industries are unusually well advanced at this time, five months in advance of opening. The 16th Exposition of Chemical Industries will be held at Grand Central Palace, New York, Dec. 6 to 11th. Three floors of the Palace have been reserved for the event and at the present time all available space on the first and second floors has been sold to exhibitors and one-third of the total available space on the third floor is under contract. List of exhibitors reads like a Who's Who of the American chemical industry and beyond this field a large number of nationally known concerns are represented because of their indirect connection with chemical manufacture.

A feature of the 16th Exposition of Chemical Industries will be the award of a prize of $250.00 in cash to the person submitting the "best descriptive expression encompassing the purposes and the benefits rebounding to the common good from the activities of the chemical industries."

Transactions in Book Form

Publication of the Transactions of the Chemical Engineering Congress of the World Power Conference, marks an important stage in the history of chemical engineering. Not only was the Congress, with its world-wide scope, the first international conference devoted to chemical engineering, but it testified that chemical engineering had come, so to speak, of age and that chemical engineers are building up their profession on the broadest scientific, economic and cultural foundations. The life of the Congress is thus reflected and made permanent in the 5 volumes of Transactions, which comprise the many papers presented by leading authorities from the chief countries throughout the world and the records of the important discussions which took place, as well as accounts of the opening and closing sessions and of the social functions which graced the Congress. The series is available from Percy Lund Humphries & Co., Ltd., London, price £12 per set, postage costs, extra.

Board of Trade to Golf

The N. Y. Board of Trade will hold its annual golf tournament Aug. 11th at the Shackamaxon Country Club, Westfield, N. J.

Representatives of the drug, chemical, and allied trades in the golf tournament and outing committee are: W. J. Bott, J. L. Hopkins & Co.; Ralph E. Dorland, Dow Chemical; Samuel W. Fraser, Burroughs, Wellcome & Co.; Joseph C. Hearn, Harold F. Ritchie & Co.; J. Leon Lascoff, J. Leon Lascoff & Son; Percy C. Magnus, Magnus, Mabee & Reynard, Inc.; Charles A. Prickitt, Upjohn Co., and George Simon, Heyden Chemical.

Metal Mining Congress

Recent New Deal tax and social legislation as it affects producers of important minerals—copper, iron ore, lead, zinc, gold, silver, sulfur, potash, tungsten, quicksilver, and molybdenum—will be thoroughly analyzed at the Annual Metal Mining Convention and Exposition of the American Mining Congress when it convenes at Salt Lake City, Utah, Sept. 7th. Sessions will last until Sept. 10th and will be sponsored by the Western Division of the Mining Congress of which Oscar N. Friendly, vice-president and general manager, Park Utah Consolidated Mines Co., Salt Lake City, Utah, is chairman.

In addition to the review of present and pending legislation bearing upon these industries, important problems in metal mine and mill operation will be subjected to comprehensive study by delegates attending the meeting.

Southern Alkali to Build Chlorine Plant

Victor Chemical to Offer Stock and Will Erect a $1,000,000 Plant to Use TVA Power—Rainier Pulp Announces Plans for $6,000,000 Mill in Florida—Other Construction News—

Construction of new plants continues to occupy a prominent place in the chemical news of the month. Hugh A. Galt, president, Southern Alkali, is authority for the statement that contracts have been let for the construction of a chlorine plant at Corpus Christi, and it is expected production will start about Jan. 1, '38. Southern Alkali owns and operates a large alkali plant at Corpus Christi and this addition will round out its operations. Southern Alkali is jointly owned by Pittsburgh Plate Glass and American Cyanamid.

Victor Arranges for TVA Power

Late in the month it was disclosed that Victor Chemical had concluded a 20-year arrangement for buying TVA power and will erect a $1,000,000 new electric furnace plant near Mt. Pleasant, Tenn., for processing phosphate rock.

Victor Chemical, it is reported, will offer 75,000 shares of stock shortly through Eberstadt & Co., N. Y. City, proceeds of which will be used to finance the new plant to be erected at Mt. Pleasant, Tenn., and which will use TVA power. This will be the first public sale of stock and the firm will apply in the near future for listing on the N. Y. Stock Exchange.

Phenolate Plant Operating

Atlantic Refining has placed in operation at its Philadelphia refinery the first plant in the east which will purify refinery gas by the new Koppers phenolate process. Plant was erected by Koppers' Engineering and Construction Division.

Koppers also has just completed a similar type of plant to purify natural gas at Wayne, W. Va., for Chartiers Oil. It will remove 95% of the hydrogen sulfide in the gas and will have a capacity of 5,000,000 cu. ft. a day. First of these plants was erected by Koppers at El Segundo, near Los Angeles, Calif., for Standard Oil Company of California and was put in operation Aug. 6, '36.

Linde to Build Oxygen Plant

Linde Air Products, Unit of Carbide, reports construction in South Chicago of a large plant for oxygen. New plant will bring the total number of Linde oxygen plants throughout the country to 70.

Tide Water Selects Girdler Process

In connection with the polymerization plant to be built at their Avon, California, refinery, engineers of Tide Water Associated Oil Co. have selected the Girbotol process for the removal of hydrogen sulfide.

This process, which was developed and is owned by the Girdler Corp., Louisville, Ky., removes hydrogen sulfide from the refinery gases before polymerization. Such prior treatment of the poly charge makes unnecessary an after-treatment of the poly product which would otherwise be required to remove objectionable sulfur compounds.

Additional Pulp Mill for the South

Rainier Pulp & Paper will erect a $6,000,000 sulfite mill through a subsidiary, Fernandina Pulp & Paper. Southern pine will be used and the plant will be located at Fernandina, Fla.

Atlas Plant Ready to Operate

The Atlas Point Plant of Atlas Powder near Wilmington was inspected by about 40 men prominent in business, professional, and public life on July 16th.

The $1,000,000 plant, located on the Delaware River beyond Rose Hill, is the first unit of a center for the production of synthetic Mannitol and Sorbitol, useful in many industries.

Visit was in the nature of an "open house" inspection with Atlas as the host and the Chamber of Commerce sponsoring the visit. It was the first inspection tour to the plant, which will probably start actual operation in the next few weeks.

Additional Construction Notes

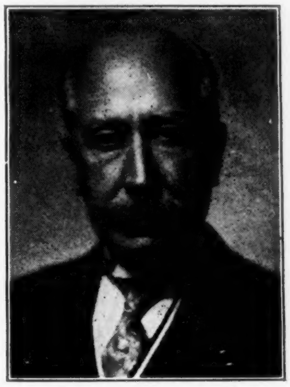
Du Pont has leased 70,000 sq. ft. from Henry Bower Chemical Manufacturing at Grays Ferry Road, Philadelphia, for expansion purposes.

Fidelity Chemical will erect a $25,000 warehouse at Houston, Tex. Another unit is being constructed at Harlingen, Tex.

Bogert Honored by Royal Society

Elected an Honorary Fellow—Baxter, Former Head of Vacuum Oil's Laboratories, is Honorary Chairman of the Rochester Meeting of the A. C. S.—Additional Personal News

Dr. Marston Taylor Bogert, professor of organic chemistry at Columbia and past president of the A. C. S., has been elected Honorary Fellow of the Royal Society of Edinburgh, Scotland.



PROF. MARSTON T. BOGERT

Now Honorary Fellow, Royal Society of Edinburgh

Professor Bogert has taught at Columbia 43 years, and has been full professor since '04. He has carried out notable researches in the synthetic organic chemical field. During the World War he was chief of the Chemical Service Section of the National Army with the rank of Colonel, and served in many other military posts.

Professor Bogert is an honorary member of the Chemical Society of Poland and of the Societe de Chimie Industrielle de France; an honorary foreign member of the Royal Society of Sciences and Letters of Bohemia; medalist of the ancient Charles University of Prague, and of the Comensky University of Bratislava, and Commander of the Order of the White Lion of Czechoslovakia.

To Preside at Rochester

Florus R. Baxter now 80, for half a century head of the Vacuum Oil Co.'s research laboratories, has been named honorary chairman of the 94th meeting of the A. C. S., to be held in Rochester, N. Y., Sept. 6 to 10th.

Bosch Heads German Institute

Dr. Karl Bosch I. G. chairman, has been elected president of the Kaiser Wilhelm Society for the Advancement of Science. The society is Germany's foremost scientific institution.

Merz, Jr., to be Married

August Merz, Jr. will be married in Honolulu Sept. 16th, to Miss Frances M. Huddleson, daughter of Colonel and Mrs. George Huddleson. Merz is a geologist with Empire Zinc. Mr. and Mrs. August Merz, Sr., will sail from San Francisco Sept. 4th to attend the wedding.

Blanc to Return to Europe

Marcel L. Blanc, president, Acticarbone Corp., will return to Europe Aug. 22nd to join his family for a two-months vacation. He interrupted his European sojourn to return to the U. S. to arrange for the company's new quarters in the Lincoln Bldg., N. Y. City.

Heavy Chemicals

Market for Industrial Chemicals Quiet

July Volume Ahead of Figure for Corresponding Month of Last Year—Tankcar Quotation on Aqua Ammonia Advanced ½c—Seasonal Items in Good Demand—Lancaster, Diamond, Resigns, and is Succeeded by Cooper—Stauff, New Solvay Director of Sales—

The markets for industrial chemicals suffered from seasonal dullness during the better part of the July period, yet the volume was not disappointing and was in excess of the corresponding '36 figures. In the last week of the month considerable pick-up was noted, indicating the possibility that the low point for the summer period had been reached. In more conservative quarters, however, it was felt that August business would just about equal that of July with the normal fall increase coming after the traditional Labor Day holiday.

Relatively few price changes were reported last month after the revisions at the half year period were made public. Antimony and its salts were higher as a result of the serious situation that has developed in northern China, following Japanese attacks on Tientsin. The tankcar quotation on aqua ammonia has been moved up ½c to the basis of 5c, but the drum prices are unaltered. The tin salts were fractionally higher when the metal advanced slightly over last month's closing price. Dynamite and saponification grades of glycerine were advanced.

Important Price Changes

ADVANCED

	July 30	June 30
Ammonia, aqua, tks.	\$0.05	\$0.04½
Antimony	.15⅜	.14⅛
Sodium stannate	.37½	.37
Tin tetrachloride	.29½	.29¼

DECLINED

None

	June '37	June '36
Exports*	\$2,504	\$1,971
Imports*	2,561	1,463

* 000, omitted.

Chlorine Shipments Heavy

A particularly heavy demand for the so-called seasonal items was noted. Chlorine shipments are very heavy and generally warm weather throughout the country has speeded up consumer requirements of anhydrous ammonia, calcium chloride, etc. A more normal labor situation at the independent steel plants has again called attention to the acute shortage of sulfuric. Producers are really experiencing difficulties in keeping up with current demand. Alkali tonnage remains good, much of the support coming from the rayon industry, which continues to operate at capacity.

Outlook in Process Industries

The seasonal let-down in the automotive field was more pronounced last month and production is estimated at 300,000 to 325,000 units. The change-over period probably will be very short this year for the automobile show is scheduled two weeks earlier than in '36.

Shoe production in the first half of the year is ahead of the corresponding period of last by about 18%. With the current rate of production showing no decline there is fear that overproduction is taking place. On the other hand, others insist that because of changed consumer habits, no serious let-down in output is likely over the next few months.

Some curtailment has taken place in certain divisions of the textile field. Rayon producers, however, are booked to capacity in most instances. A steady improvement in cotton textile buying is anticipated in August, which will probably be reflected in greater mill activity. Some recession from the recent high level of domestic wool mill consumption is said to be in prospect during the remainder of the year, yet the volume should not be disappointing. Some improvement in silk is looked for in the immediate future in anticipation of a better demand this fall.

Statistics of Production

On June 30th 24,555,716 cotton spindles were operating, compared with 24,659,296 for May and 23,021,042 for June, '36. Silk deliveries to mills totalled 35,783 bales, an increase from the May figure of 35,278 and a decrease from the '36 monthly average of 37,900 bales. May cotton consumption totalled 669,460 bales, compared with 718,947 in April, 530,894 in May '36, and a '36 monthly average of 591,450 bales. May total wool consumption of 34.0 million lbs. was below the April figure. May shoe production amounted to 34,990,219 pairs, a decline from the 40,185,638 pairs in April but ahead of the 30,264,351 pairs produced in May a year ago. The corn grind of 11 manufacturers in June was estimated at 5,728,455 bu., as compared with 6,572,464 in May and 5,079,732 in June of last year.

Glass Activity at Low Rate

The glass industry operated at a very low rate in July. Slowing down temporarily of production lines in the Detroit area, plus a somewhat disappointing situation still continuing in the building field are the two adverse factors. Akron rubber plants are seasonally slow. Tire inventories (around 12,000,000) are much higher than they were a year ago and have been deliberately built up by the manufacturers in preparation for possible labor trouble. In many quarters little improvement is now looked for for several weeks to come. Consumption of rubber has averaged 52,060 tons during the first 5 months of '37, an increase of 12.7% above the comparable figures for the previous year.

Newsprint production in Canada in the first half has increased 19.7% and in the U. S. 2.2% over the corresponding totals for '36. Current manufacturing operations in the paper field continue heavy. Gasoline consumption is ahead 11.3% in the first half over the same period of last year and refining operations are at a peak at the moment.

Cooper Again With Diamond

George S. Cooper is returning to Diamond Alkali to succeed Fred G. Lancaster, vice-president in charge of sales, who is retiring. Mr. Cooper was sales manager of Diamond from 1922 to 1932 when he resigned to become a vice-president of the Prior Chemical Corp. He received his education at George Washington University and the University of West Virginia. His first connection with the chemical industry was with Hooker Electrochemical in '19 and the following year he became vice-president of W. F. George Chemicals, Inc. In a short time he became associated with the sales division of Diamond in Pittsburgh.

Mr. Cooper was tendered a surprise luncheon by his intimate friends a few days before he left for Pittsburgh to take up his new duties.

Solvay Announces Changes

John Stauff is now director of sales for Solvay, succeeding W. B. Blair who now becomes director of research and planning. L. B. Gordon, western sales manager for several years, is now assistant director of sales. A. B. Chadwick remains as executive vice-president, Harold Merritt, vice-president in charge of sales, and Charles Grossman, N. Y. District sales manager.

Johnson Dies Suddenly

Edward M. Johnson, 58, vice-president, Arnold Hoffman & Co., Providence, R. I., died on July 7th after a short illness. Mr. Johnson's entire business career was spent with Arnold Hoffman Co., starting in as a clerk in 1898 and rising step by step through the sales department and into executive positions.

Clark Joins Columbia

W. I. Galliher, director of sales, Columbia Alkali, reports appointment of Vernon L. Clark as district sales manager at St. Louis with offices at 1106 Central Industrial ave. Mr. Clark, originally from N. Y. City, has been located in the Middle West since '29 engaged in the Alkali business. He established Clark Chemical at Indianapolis who are distributors for Columbia products as one of their major interests. Clark Chemical is still in operation and is very much a going concern although Mr. Clark severed his connections with it before joining the Columbia organization.

Vaughan Dies June 19

A. Roy Vaughan, 60, died very suddenly on June 19 in Chicago. Mr. Vaughan had been associated with Monarch Chemical and affiliated companies for 30 years.

Adopts Group Insurance

Delta Chemical & Iron, Wells, Mich., manufacturer of charcoal pig iron, redistilled acetic acid, refined methanol and methyl acetone, has adopted a group insurance program providing 150 employees with sickness and accident benefits. Plan is being underwritten by Metropolitan Life on a cooperative basis, whereby the employer and employees share the cost.

German Salt Cake Trade

Germany's export trade in salt cake has been considerably influenced in recent years by the growth of kraft paper manufacturing in the southern part of the U. S. More than 102,500 metric tons of salt cake were exported from Germany to the U. S. last year against 34,625 tons in '32. In the first quarter of the current year Germany's exports of salt cake advanced further to 61,260 metric tons from 40,015 tons in the first three months of 1936—the share of the totals going to the U. S. during these periods increased from 23,500 to 45,375 metric tons.

The Story of Cellophane

The August issue of Priorities (house organ of the Prior Chemical Corp.) will be devoted to Cellophane. Copies are available by writing the company direct at 420 Lexington ave., N. Y. City.

Heavy Chemical Jottings

General Chemical is opening a warehouse in Milwaukee at 205 S. 15th st. . . Joseph Turner is opening its new Chicago office at 40th st., and Calumet ave., under the direction of John L. Thomas. . . M. W. Hall, formerly with Toledo Plaster & Supply, is a new dealer in industrial chemicals. . . Annual picnic of Warner's Carteret, N. J. plant was held July 3rd and Works Manager C. H. Watson, Vice-president "Lou" Neuberg, and Assistant Sales Manager "Shorty" Wyatt attended. . . Denver Fire Clay is in larger quarters at 2301 Blake st.

Exportation of copper sulfate from Germany has been forbidden. . . An increase of 30 lira per ton in the domestic price of crude sulfur has been authorized by the Italian Ministry of Corporations. . . Canadian Indian Industries, Ltd., plans erection of a third unit for the production of caustic and chlorine which will represent a capital outlay of $2,000,000, and work on the new plant, which will require one year for completion, will commence immediately.

The Oil Well Supply Co., Oil City, Pa., is celebrating its 75th anniversary.

Salesmen's 3rd Golf Party

The Chemical Salesmen's 3rd golf tournament of the season will be held at the Pomonok Country Club, Flushing, L. I., on Tuesday, Aug. 17th. Members holding '37 dues cards and who entered the Baltusrol play in June will be entitled to "a free ride."

Usually the 4th and last tournament of the season is held at the Pomonok Club, but this year the big "whoopee" party will be held Sept. 14th, at the Washington Irving Country Club, formerly Rockwood Hall, Tarrytown, N. Y.

COMING EVENTS

"Achema VIII," Plant exhibition, in connection with 50th General Meeting of Verein Deutscher Chemiker, Frankfurt, Germany, Sept., 1937.

American Mining Congress, Salt Lake City, Sept. 6-10.

American Chemical Society, 94th Meeting, Rochester, N. Y., Sept. 6-10.

N. Y. Board of Trade, Golf Outing and Meeting, Shawnee-on-Delaware, Buckwood Inn, Pa. Date from the secretary.

Ceramic Association of N. J., Atlantic City, Sept. 16-17.

National Safety Council, Kansas City, Mo., Oct. 11-15.

American Gas Association, annual meeting, Oct. 11-16.

Pa. Water Works Association, annual meeting, Atlantic City, Haddon Hall, Oct. 13-15.

The Electrochemical Society, annual meeting, Hotel Chase, St. Louis, Mo., Oct. 13-16.

Technical Ass'n Pulp & Paper Industry, Fall Convention, De Soto Hotel, Savannah, Ga., October 18-20.

American Society for Metals, Congress and Exposition, Atlantic City Auditorium, Atlantic City, Oct. 18-21.

National List Control Association, annual meeting, Memphis, Oct. 25-27.

N. P. V. & L. A., Convention, Cincinnati, Ohio, Oct. 27-29.

Ohio Ceramic Industries Association, annual meeting, Columbus, Nov. 5-6.

American Association of Textile Chemists & Colorists, annual meeting, Bellevue-Stratford Hotel, Philadelphia, Dec. 3-4.

Exposition of Chemical Industries, Grand Central Palace, N. Y. City, Dec. 6-11.

Fifth International Heating & Ventilating Exposition, Grand Central Palace, New York City, Jan. 24-28, 1938.

LOCAL TO NEW YORK

Chemical Salesmen's Ass'n, Golf outing: August 17, Pomonok Country Club, Flushing, L. I., N. Y.; September 14, Washington Irving Country Club, Tarrytown, N. Y.

Members wishing additional information should communicate with Bart Sheehan, Grasselli Chemicals Dept., du Pont, Empire State Bldg., who is chairman of the entertainment committee.

Mutual Seeks Injunction

An attack on the constitutionality of the recently passed zoning law of the city of Baltimore for airports was made Aug. 2nd in Circuit Court No. 2 when the Mutual Chemical Company of America asked an injunction against enforcement of the new law.

The chemical firm owns a large tract of land adjacent to the municipal airport. Provisions of the zoning act, passed by the last Legislature, restrict the height of buildings in the vicinity of the airport and provide for condemnation proceedings against those already existing in violation of the new restrictions.

Asks Tariff Change

Senator Royal A. Copeland (N. Y.) has introduced a bill which would amend the 1930 tariff act specifically to remove "white oils under whatever name known conforming to Petrolatum Liquidum United States Pharmacopeia" from the free list.

New V.-C. Sales Manager

J. A. Howell has been appointed sales manager for Virginia-Carolina Chemical. He will have general supervision of the operations of all the company's sales offices, M. S. Purvis, vice-president, reports.

I. C. C. Chlorine Ruling

Application for a reduction on rates on liquefied chlorine gas, tankcar loads, from Hopewell, Va., to Kreole and East Moss Point, Miss., has been denied by the I. C. C.

Lime In 1935

Manufacturers of lime during '35 reported a total production value of $23,-322,071 for all products, compared with $16,200,313 for '33 according to a preliminary report on the industry by the Bureau of the Census compiled from returns of the biennial census of manufactures. Of the total, $18,423,448 was the value of 2,476,345 tons of lime. Number of wage earners increased 25.5% and the total amount of their wages 48.4% over 1933.

New Muriatic Plant

Consolidated Chemical Industries will erect a new muriatic acid plant at Fort Worth, Texas, according to Milton Haas, vice-president. Plant will serve oil producers in Texas, New Mexico, Oklahoma and Kansas for the acidizing of oil wells in limestone and dolomite formations.

Coal-Tar Chemicals

Increased Demand for Benzol for Blending Purposes

Decline in Automotive Production Curtails Use of Xylol and Toluol—Scarcity of Cresylic Continues—June Coking Operations Below May Average—

Important Price Changes

ADVANCED

	July 30	June 30
Naphthalene, crude dom.	$2.50	$2.00
Imported	2.25	2.00

DECLINED

None

	June '37	June '36
Exports*	$1,335	$ 803
Imports*	1,876	1,963

* 000, omitted.

Increased demand for benzol, largely for gasoline blending, featured the coal-tar chemical markets in July. Some slackening in the requirements of lacquer producers for xylol and toluol reflected the seasonal let-down in automotive manufacturing. No improvement in the tight position of cresylic has taken place and spot stocks are difficult to obtain. The same thing is equally true of phthalic anhydride.

At the moment interest in crude naphthalene is at a low ebb. Refiners are busy overhauling plants and active purchasing is not likely to be undertaken in a major way for several weeks yet. In the meantime prices of crude, both domestic and for import, have strengthened. A very steady market has prevailed all season for refined and stocks have all been cleared up. In fact some producers have been forced to go out into the market for additional supplies to cover late needs.

A good demand continues for creosote. Phenol shipments are heavy to the plastics manufacturers. A feature of the market is the number of inquiries from the Far East for a wide variety of coal-tar products. An irregular call was reported for intermediates and dyes, but the total volume is greatly in excess of the corresponding '36 totals.

A very short change-over period is expected in the automobile industry this summer for the demand for cars is still very heavy and the automobile show is scheduled two weeks earlier than last year. As a result the requirements of lacquer producers for solvents should show a decided pick-up in the next 30 days. The picture in rubber is not quite so rosy. Tire inventories are over 12,000,000 units, the largest in the history of the industry and more than 50% above a year ago. Currently Akron plants are operating but one or two days a week. The manufacturers have deliberately built up large inventories as a defense against unfair labor demands. However, they are not likely to speed up production until the present inventory is cut down.

June production of coke from byproduct and beehive ovens amounted to 4,298,559 tons. This represented a daily average output of 144,692 tons, which was 7.8% below that of May, but 14.2% above the rate prevailing in June a year ago. Total tonnage for the first half of '37 increased 29.2% over the corresponding period of '36, while production of pig iron in the same period increased 45.7%.

The output of byproduct coke for the 30 days of June was 4,024,259 tons, or 134,142 tons per day. In comparison with May the daily rate decreased 7.2%. Strike conditions at steel plants affected the output of furnace plants, where the daily rate dropped 10.7%. At merchant plants a gain of 3.6% was made.

Deaths of the Month

William Lesser, 85, one of the organizers of Hudson Aniline, which later became General Aniline, died in Albany July 10th. He studied dyes at night at a Berlin technical school and came to this country in his 20's, settled in Albany and found employment with the old Albany Chemical Co. He soon interested Louis I. Waldman, noted financier, in starting General Aniline.

Charles Ware, 72, retired chemical manufacturer, founder of Stone & Ware which was later absorbed by National Aniline, died on July 7th in a Milwaukee hospital. He was a National Aniline v.-p. when he retired in '17.

Warner Joins Calco

John F. Warner, who has been affiliated with the Pacific Mills for may years, has joined Calco Chemical as vice-president. Mr. Warner's experience in textile printing and finishing, with his early training with Standard Anilie Products and the Dye Division of Grasselli Chemical Company, particularly equips him for coordinating the manufacturing, research, technical, and service divisions of Calco.

Dip Market in the Argentine

A huge market for animal dips exists in the Argentine. Bulk of the prepared animal dips are still supplied by foreign countries, imports in '35 totaling 7,926,600 kilograms. The United Kingdom continued to be the predominant source of supply, having furnished 7,763,400 kilos, and the U. S. only 133,400.

Road Oil Use Up 21%

Increased construction of the lighter types of highway resulted in an increase of 21% in the sales of road oil by petroleum refineries in the U. S.—from 6,798,932 barrels in '35 to 8,256,694 barresl in '36.

Morrow Back from Europe

Herbert S. Morrow of Calco Chemical has just returned from Europe after completing a 6 weeks' tour of industrial research in England, France and Germany.

Coal-Tar Odds and Ends

Germany finding naphthalene costly as the raw material for carbon black is experimenting with anthracene. . . Ford has just placed an order for 61 coke ovens with Koppers. . . Exportation of phenol and cresol, except under special license, is prohibited by a German ordinance which became effective on June first. . . U. S. production of coal-tar medicinals increased around 20% last year or from 10,022,700 to 12,033,850 lbs., according to statistics gathered by the Tariff Commission. By volume more than one-third of the total consisted of aspirin. . . Calo & Lydon, 90 West st., N. Y. City, is now the metropolitan N. Y. sales representative of The Neville Co., Pittsburgh. . . U. S. production coal-tar resins was recorded at 116 million lbs. last year against 91 million in '35 and 29 million in '32.

New Coke Ovens Nearly Ready

Construction of 146 Becker type coke ovens for the Tennessee Coal, Iron & Railway Co., Birmingham, Ala., is nearing completion by Koppers and it is expected that the ovens will be put into operation within the next few weeks. A new battery of 59 Becker ovens is also nearing completion at the plant of Inland Steel, Indiana Harbor, Ind., and is expected to be producing coke by October.

Heads N. Y. P. A's

Benedict Van Voorhis, of the du Pont plastics department has been elected president of the Purchasing Agents Association of New York. Mr. Voorhis was recently elected chairman of the Chemical and Allied Products Buyers Group of the National Association of Purchasing Agents.

Luaces Returns from Cuba

E. L. Luaces, consultant on solvent recovery methods, has returned from a 3 week's trip to Cuba. While there he attended the marriage of one of his sisters.

Fine Chemicals

Good Demand for Citric, Tartaric Acids

Mercury Reduced as Spanish Metal is Released—Larger Stocks of C. P. Glycerine Available—Chew in Essential Oil Field—Kleber Dies—

The market for fine chemicals in July was routine, with very few price changes, a reduced volume of shipments as compared with earlier months, but a good demand for seasonal items.

After several months of extreme firmness and advancing prices the market for quicksilver turned soft. The entrance of additional Spanish supplies at a time when domestic consumption was off is the reason advanced for the decline. At the close of July no changes had been made in mercurials and none were anticipated in the trade, unless the price of the metal continued to work down further.

It was somewhat easier to obtain spot stocks of glycerin last month. While the c. p. grade remained unchanged at the 21½c level, the saponification and soap-lye grades were advanced ½c. A slight let-down in foreign inquiries on this item is reported. Other price changes of the month include a 25c reduction for mendelic acid and a 50c decline for sodium mandalate. An additional sharp reduction was announced for sulfanilamide. Producer of the latter is now said to have increased production facilities to the point where immediate shipments can be made.

Hot weather prevailing over most of the country has increased substantially the demand for citric acid, tartaric acid and the tartrates. While no further advances have been made in the tartars in the past month they bear watching, for the cost of the raw material shows no sign of declining, but if anything, may go into still higher price levels.

Important Price Changes

	July 30	June 30
ADVANCED		
Aloin	$ 1.80	$ 1.60
Cocoa Butter	.18½	.17½
DECLINED		
Acid mandelic	$ 2.40	$ 2.65
Corn syrup 42°	3.91	4.46
43°	3.96	4.51
Mercury	94.00	97.00
Sodium mandalate	3.75	4.25
Sulfanilamide	3.25	4.65

Hearing on Menthol, Camphor Tax

Proposed bills for taxing imported menthol $1 per pound and imported natural crude and refined natural and synthetic camphor 10c per lb. were given brief hearings July 22nd before the sub-committee of the House Ways and Means Committee. Importers were represented by Eugene Pickerel, an attorney. It is thought that the committee will not take any action on the proposed measures at this session.

Chew in Peppermint

John A. Chew, Inc., 60 E. 42nd st., N. Y. City, is now sole eastern distributor for Michigan Peppermint Growers, Inc., St. Johns, Mich.

Kleber Dies in 74th Year

Dr. Clement Oscar Kleber, 74, president of Clifton Chemical Laboratories, and noted chemist in the essential oil and aromatics fields, died at his home in Clifton, N. J., on July 14th. Before founding the Clifton plant in 1906 he was for many years a director in Fritzsche Brothers. In 1900 Heyden bought the Garfield plant of Fritzsche and Dr. Kleber served with the former for 6 years.

He was born in Germany and studied at Heidelberg, Berlin, and Leipzig. He came to this country in 1893 and was married in the same year to Miss Anna Amelia Schmidt of Cassel, Germany. His wife died in 1918. He was particularly famous for his work on peppermint oil and bay oil and for the analytical methods he devised. Dr. Kleber turned over the active management of the Clifton plant to Dr. Arthur Nicholaus about 8 years ago, but continued active in his charity and garden activities. His home was one of the show places of Passaic County.

Fritzsche Doings

After a 2-months' business and pleasure trip abroad, Ben. F. Zimmer, vice-president of Fritzsche Brothers, has returned, via the company's head office in N. Y. City, to his office in Chicago.

Membership of Fritzsche's exclusive Quarter of a Century Club is growing. On July 15th, Miss Mary G. Neary, secretary to F. H. Leonhardt, president, was admitted as the 9th member of the organization to be so honored.

Fritzsche has restyled its labels on its entire line of essential oils and aromatic chemicals.

Bromine Production Up 25%

Bromine production jumped 25% in quantity and 16% in value in '36 over '35 and totalled in value $4,038,438 and 20,-609,025 lbs. in volume. Ethylene dibromide imports totalled 1,253,971 lbs. compared with 477,005 lbs. in '35.

New Quicksilver Producer

A group of N. Y. and Nevada financiers have purchased a quicksilver mine at Bottle Creek, Nevada, and production is scheduled for Sept. 1st.

Lindsay Resumes Dividends

Lindsay Light & Chemical resumed dividends on the common with a 10c declaration last month. Last previous payment was 5c on August 24, '36.

Fine Chemical Briefs

A Jap-Chilean agreement signed July 1st for a period of 10 years is expected to end competition in iodine. . . George W. Merck, president of Merck & Co., is now on the Colgate-Palmolive-Peet board. . . Italian scientists claim to have perfected a new method for the manufacture of citrate of lime from lemons which increases the yield as well as the purity of the product.

Du Pont Booklet on Perfumes

Du Pont has issued an informative 16 page booklet with the title "Synthetics Bring New Era in Perfumes." Booklet is divided into 4 sections—"Synthetics Bring New Era in Perfumes," "The Making of Perfumes," "Synthetic Perfumes in Soaps and Cosmetics," and "Per fume Usage in Industrial Products and Processes."

Personnel

Adams Now Board Chairman

C. E. Adams, formerly president of Air Reduction is now chairman of the board and C. S. Munson, formerly vice-president, is now president. Mr. Adams will continue actively in charge of the company.

Hawn Now a Monsanto V.-P.

R. J. Hawn, a director of manufacture with several Monsanto plants under his supervision, has been elected vice-president. He had been a vice-president of Swann Chemical prior to its absorption by Monsanto in '35.

Additional Personnel News

Glascote Products, Inc., Cleveland, Ohio, manufacturers of glass-lined mixing and storage tanks, evaporators, etc.—announces the appointment of Charles W. Glaser as sales representative for the metropolitan N. Y. territory.

Others in new posts are:—Harold W. Paine new duPont director of research on plastics, succeeding the late Dr. Allan F. Odell. . . Dr. Frederick C. Hahn takes the place vacated by Mr. Paine. . . W S. Coe with U. S. Rubber Products has been transferred to the Naugatuck Division at Naugatuck.

Richard F. Robey is now a research chemist with Standard at Linden, N. J. . . P. S. Pinkney is research for du Pont at Wilmington.

Solvent Prices Steady — Demand Light

Standard of N. J. Offers New High Solvency Aromatic Naphthas—Bureau of Internal Revenue Issues Several New Regulations—Methyl Acetone Quotations Reduced—

Solvents and Plasticizers

The market for petroleum solvents was in a strong position last month in so far as prices are concerned, but an appreciable decline in shipments was reported in the eastern and mid-west sections. This is not difficult to understand for the automotive industry is now in the period of readjustment for next year's models and the tire producers are marking time at the moment.

Price revisions were limited to a few changes in tankwagon quotations. Petroleum thinners were advanced in the Bound Brook and Perth Amboy sections on July 23rd and a 13½c price for cleaner's naphtha was announced in Bridgeport early in the month. At the same time an 11c quotation was established on petroleum thinners on either tankwagon or drums to users of more than 1,000 gals. per year in the 5 boroughs comprising the greater N. Y. City area.

The new high solvency aromatics are being offered in 3 grades, No. 1 at 19c per gal., No. 2 at 21c, and No. 3 at 16c in tanks, f. o. b. Bayonne. A more detailed description of these interesting new solvents is given below.

Alcohol prices continue steady at the new levels established for the 3rd quarter. Producers are beginning to give thought to anti-freeze business, but as yet no indication has been given of just what marketing plans will be employed this year. A sharp reduction of 12c per gal. was noted in synthetic methyl acetone in the 3rd week of the month following a 3c reduction in natural material made in the previous week.

A rather poor call was in evidence for most of the lacquer solvents. This situation is regarded as but being of a very temporary nature, pending the change-over to the '38 models. This period is expected to be very short for no startling innovations are planned. One manufacturer reports that he will require only 10 days to get started. No changes were reported in the price structure for acetone, butyl alcohol, butyl or ethyl acetates.

Important Price Changes

ADVANCED

None

DECLINED

	July 30	June 30
Methyl acetone nat. tks.	$0.33	$0.36
drs.	.39	.42
Synthetic, tks.	.36	.48
drs.	.42	.52½

Prime-Cut Solvessos Offered

Standard of N. J. is offering new high-solvency aromatic naphthas for application in nitrocellulose lacquers and synthetic enamels under the name of "Prime-Cut Solvessos." A new unit was erected at Bayway for the production of the new solvents.

May Buy Industrial Business

Rumors of negotiations between American Commercial Alcohol and Commercial Solvents for the sale of American's commercial alcohol business to Solvents are heard. If such a deal were consummated it would confine Commercial Alcohol's business entirely to the distillation of liquor.

Hercules Registers "Dipensol"

Hercules Powder is entitled to register "Dipensol" as a trademark for a terpene hydrocarbon solvent, in a recent ruling by the Patent Office. Question was whether it would conflict with "Penzoil" belonging to the Pennzoil Co., Los Angeles. Examiner held that, inasmuch as the marks were not to be used on similar goods there was no likelihood of confusion.

Solvents Joins A. N. A.

Commercial Solvents has joined the Association of National Advertisers, with R. J. Flood, manager of anti-freeze sales, as its representative.

New Rule on C. D. Alcohol Sales

Treasury Dept. on July 21st issued an order prohibiting the sale of denatured alcohol or denatured rum under circumstances suggesting that it is to be used for beverage purposes. Order is a new paragraph to regulations No. 3 of the Bureau of Internal Revenue. Order is expected to strengthen the department's control over sale of denatured alcohol where there are reasons to believe that the suppliers are working with the users to divert the material for illegal or beverage purposes.

Denaturing Special Alcohol

Only anhydrous tertiary butyl alcohol will be used for the denaturation of special denatured alcohol under revised specifications effective at once, issued July 26th by the Bureau of Internal Revenue. Users have been complaining of the corrosive effect of the water content. New specifications are given in A. T. No. 309.

Regulations on Ethyl Acetate

Amended regulations covering the denaturation of ethyl acetate were announced July 16th.

The specially pertinent sections of the new ruling are:

"Effective immediately, ethyl acetate must be denatured before being removed from the premises of the manufacturer by adding to every 100 gallons of ethyl acetate one-eighth gallon of calol ethatate, or other products or chemicals which possess denaturing properties satisfactory to the commissioner; provided, that ethyl acetate used as a denaturant for specially denatured alcohol or for pharmaceutical, scientific, and food preparations, or where it is exported, or transferred from one producer to another producer need not be denatured.

"Where undenatured ethyl acetate is received by a producer from another producer it must be denatured before it is sold to dealers or users unless it is sold for purposes where undenatured ethyl acetate may be used, as provided in the preceding paragraph.

"Any manufacturer desiring to purchase ethyl acetate denatured with products or chemicals in lieu of calol ethatate shall make application to the commissioner showing in detail for what purpose the ethyl acetate is to be used, and why he cannot use such material denatured with calol ethatate. The application should show the kind and quantity of products or chemicals that the purchaser of ethyl acetate desires to be substituted for calol ethatate, in order that it may be determined whether they possess satisfactory denaturing properties.

"Treasury Decision 53, approved April 28, 1930, and the last paragraph on Page 5 of the appendix to Regulation No. 3, revised October, 1931, pertaining to the denaturation of ethyl acetate, are hereby rescinded."

Petroleum Construction

Richfield Oil, successor to the Richfield Oil Co. of California, has authorized expenditure of approximately $5,000,000 for construction of a new refinery at Watson, Calif.

Standard of Louisiana, subsidiary of the Standard of N. J., has given a contract to Arthur G. McKee & Co. for designing and construction of a new $500,000 Universal Oil Products Co. non-selective polymerization plant to be built at Baton Rouge.

Acticarbone in New Quarters

Executive offices of the Acticarbone Corp. (solvent recovery systems) will be located on and after Aug. 15th on the 7th floor of the Lincoln Bldg., N. Y. City. For some time the company has felt the need of larger quarters than could be obtained in the Cunard Bldg. suite.

CHEMICAL

A Photograph Album

The twentieth anniversary of the World War is a proper time to remember that these men and many other chemical leaders were in their country's service.

Frederick G. Zinsser, Colonel, Chemical Warfare Service (Zinsser & Co.).

Bradley Dewey, Colonel, Chemical Warfare Service (Dewey & Almy).

Howard Berry, Captain, Chemical Warfare Service (Mathieson Alkali).

D. Percy Morgan, Lieut., U. S. Navy (Scudder, Stevens & Clark).

Below, Henry Bower, Lieut., Flying Corps, U. S. M. C. (Henry Bower Chemical Mfg. Co.).

NEWS REEL

of Twenty Years Ago

Charles H. Dresser, in French Ambulance Corps service, at extreme right (Anderson-Prichard Oil Co.).

S. J. Cohen, Lieut., Field Artillery, U.S.A. (Amecco Chemicals, Inc.).

Benjamin R. Harris, Chemical Warfare Service (Epstein, Reynolds & Harris).

Edgar M. Queeny, Lieut. Jr. Grade, U. S. Navy (Monsanto).

Charles Belknap, Commander, U. S. Navy (Merrimac).

William M. Rand, Lieut. Sr. Grade, U. S. Navy (Merrimac).

Agricultural Chemicals

Sodium Nitrate Schedule Revised Upward

Bulk Now Quoted at $27 Per Ton—Superphosphate Scarce—Tag Sales Up 29% in Past Fertilizer Year—Total Sales Over 8,000,000 Tons—Bright Outlook for Next Season—

The quotations on Chilean nitrate announced June 23rd were suddenly cancelled Aug. 2nd and the following schedule placed in effect: bulk for delivery up to and including June 30, 1938, $27 per ton, f. o. b. port warehouses. This compared with the previous price of $26.50 per ton, ex vessel at the ports. Prices for material in bags in the New England States, N. Y., N. J., Pennsylvania, Delaware, eastern shore of Maryland and all Middle Western States, comprising District 10, including Kentucky, are $28.30 per ton in 200-pound bags and $29 per ton in 100-pound bags. These prices are also f. o. b. and all apply for shipment by rail or boat only. Deliveries to trucks are 50c per ton additional either for bagged or bulk material. No prices have been available on urea-ammonia liquor. Suppliers of nitrogen solution are offering spot material at $1.04 per unit of ammonia, an increase of 4c over the contract price which prevailed through June. Quotations on Jap sardine meal continue to rise with $48 per ton named for shipments as the month closed. Freight rates are in part responsible for the firmness in this item. In the Baltimore district prices on fish scrap are purely nominal. The organic ammoniates were generally weaker late in the month after showing strength in the first two weeks. Cottonseed meal prices were down and this trend affected the market for organic ammoniates. Only routine interest was displayed in most of the markets for raw materials. Sales were very few and far between and most of the interest now centers in the outlook for next year.

The tight situation, however, in superphosphate remains unchanged. The proposed hearing before the I. C. C. on suggested increased freight rates on superphosphate has been postponed at the request of the carriers.

June Tag Sales Higher

Sales of fertilizer tax tags in 17 states in June were well above the corresponding month of recent years. Increase over last year was due to larger sales in the South Atlantic States, with declines or negligible gains occurring in other regions. June sales are usually quite small, particularly in the Midwest.

Sales volume as represented by the sale of tax tags in the 17 states rose to 5,863,000 tons in the year ended with June, an increase of 29% over last year and by far the largest tonnage for any fertilizer year since 1929-1930. Sales in the year just closed failed to reach the 1929-1930 peak by 3%. In each of the reporting states the 1936-1937 sales were larger than in the year preceding, with the increase a very substantial one in every case except Oklahoma.

Important Price Changes

	July 30	June 30
ADVANCED		
Fish scrap, Jap.	$48.00	$47.00
Sodium nitrate		26.50
Tankage, N. Y.	3.60	3.50
DECLINED		
Bone meal 3 & 50, imp.	$26.50	$27.50
Calcium phosphate, dibasic	.75	.76
Castor pomace	24.00	25.00
Nitrogenous mat., East	3.10	3.40
Mid-West	2.90	3.25
Imported	3.25	3.50

Tonnage in the entire country in the year ended with June is estimated at 8,005,000 tons. This represents an increase of 23% over 1935-1936 compared with the 29% rise in the tag sale states. Fertilizer consumption in the Northeastern States is not showing as large an increase as are other areas. It is possible that when complete data are available they will show the 8,005,000 estimate to be somewhat low. In view of the continued high level of farm income and of the effect of the Soil Conservation Program, tonnage this fall should be somewhat larger than last year. It seems likely that consumption in the calendar year will rise above the previous peak of 8,163,000 tons which took place in 1930. Consumption in the South, where recovery from the depression low point has been slow, will be near the peak level this year. In the Midwest and West the peak will be exceeded.

Exports Up—Rock Shipments Heavy

Fertilizer and fertilizer material exports in May were somewhat larger than last year. Increase was due in large part to larger exports of land pebble rock.

Total exports in the July-May period were 22% under the corresponding period of 1935-1936, with all important items showing declines except superphosphate. Ammonium sulfate exports have been nearly a hundred thousand tons smaller this year than last.

May import tonnage exceeded May of last year by 27% but was smaller than two years ago. With the exception of ammonium sulfate, nitrogenous materials were imported in greater volume this year than in May 1936, with the gain in the group as a whole being largely due to larger imports of sodium nitrate.

Most materials imported were brought in in larger quantity in July-May than a year earlier, the exceptions being ammonium sulfate, castor bean pomace, and manure salts. Particularly large increases have occurred in imports of muriate of potash, kainite, and sulfate of potash.

Superphosphate Larger Than Normal

Although superphosphate production in May was somewhat less than in April the decline was much smaller than usual and compared with May of recent years the month's output was unusually large. May production was 85% above May '36 and 129% larger than in May '35. Very substantial increases over last year were reported in both the Northern and Southern Areas. In the first 11 months of the current fiscal year, from July through May, production was 41% larger than in the corresponding period of last year.

Shipments to mixers and in mixed goods were much larger in May than a year ago but shipments made directly by acidulators to consumers and dealers were somewhat smaller. In the July-May period all classes of shipments were larger than in the same period of last year. Stocks of bulk superphosphate at the end of May were slightly smaller than a year earlier while the volume of superphosphate contained in stocks of mixed goods was moderately larger.

Good Farmer Purchasing Power

Outlook for sales of mixed fertilizers during the coming season is particularly bright in all sections of the country, despite the fact that higher prices will undoubtedly prevail as a result of advances in nitrate, sulfate, potash, and other important raw materials. Farmers are enjoying bumper crops and with increased income will be in a favorable state of mind to increase their use of fertilizer. In connection with the question of prices the N. F. A. has released statistics which show that mixed fertilizer has increased 8%, raw fertilizer materials, 11%, all commodities, 13%, and farm products 17%.

New Fertilizer Plants

Two new fertilizer plants have been announced, one by Woodward Distributing at Aiken, S. C., and the other at Fostoria, Ohio, by The Ohio Farmers Grain & Supply Co.

James Rossman, formerly president, Berkshire Chemical, Bridgeport, Conn., an affiliate of Davison Chemical, Baltimore, has organized with William Woodruff, the Woodruff Fertilizer Co., Orange Center, Conn.

Frederick J. Maywald, 67, consulting chemist and one of the pioneers of the Florida phosphate mining industry, died July 3rd at his home in Rutherford, N. J.

Andrew Lee Hannah, Sr., 73 an official of V.-C., died of a heart attack in Richmond on July 6th.

Personnel Changes

W. Newton Long has resigned from Davison Chemical and is now president, Miller Chemical & Fertilizer, Baltimore.

Davison Chemical has appointed J. A. Reid, manager of the Nashville division, and Vincent Sauchelli sales manager of the bagged goods department.

German Potash Sales Up 2½%

Sales of the German potash syndicate increased a little more than 2½% to a total of 1,364,000 metric tons (potash basis) last year with domestic sales accounting for 74½% of the total against 71 in '35. In the first 5 months of the current year sales by the syndicate were recorded at 736,000 metric tons—a gain of more than 9% over the corresponding months of '36.

Dead Sea Potash Output

Recovery of Dead Sea potash has almost doubled during the past two years judging from exports which aggregated 23,372 metric tons in '36.

Sulfate Not Dumped

Treasury has issued a finding that sulfate of ammonia is not being dumped here by Japan, Canada, Netherlands, and Manchuria.

Good Demand for Insecticides

Demand for agricultural insecticides was generally good in the past month. The warm weather with just a fair amount of rain has been ideal for the spread of infestations of many of the commoner parasites. The cotton flea hopper is giving more concern in the south than the boll weevil. The seed-corn maggot has caused serious trouble in the Connecticut tobacco sections. Consumption of the arsenates, Bordeaux, nicotine sulfate, etc., will probably reach close to record levels this season. Prices are firm.

Money for Grasshopper Bait

One million dollars became available on July 16th for insect control when the House and Senate passed a joint resolution, H. J. Res. 431. It is understood that most of the appropriation will be used for poison bait to fight grasshoppers in several western states.

Ruling on Calcium Arsenate

Manufacturers of calcium arsenate, used as an insecticide, have been advised by Cassius L. Clay, Louisiana State analyst, that under new regulations of the State Board of Health all such products sold in Louisiana must be colored.

Dismisses Rock Injunction

Judge W. Calvin Chesnut, in the Baltimore U. S. District Court on July 20th, granted a government motion to dismiss a temporary injunction against assessment of $60,000 in duties on phosphate rock in the equity suit brought by Clare M. Cottman, executrix of the estate of L. Warrington Cottman, who was a partner in the J. H. Cottman Co. Plaintiff had sought to enjoin the Collector of Customs from placing a special assessment on several shipments of rock imported in '27 and '28. Judge ruled that the court had no jurisdiction in the case.

Phosphate Rock in '36

Continued improvement in the U. S. fertilizer industry was reflected in the further advances in the phosphate-rock industry in 1936. Statistics furnished by the producers of domestic phosphate rock to the Bureau of Mines, show gains in '36 over '35 in total mine production, in total tonnage shipped or used, and in value of shipments. Total shipments were the largest since '30, and domestic consumption of phosphate rock continued to increase. Exports were somewhat larger than in '35, but the trend of a 12 months' moving total curve of monthly exports of phosphate rock turned downward in the last half of the year, and this downward trend continued into '37. Imports were small. Total stocks of phosphate rock in hands of producers on Dec. 31, '36, were considerably higher than those at the end of '35. Phosphate rock was mined in Florida, Tennessee, Idaho, and Montana, and apatite in Virginia.

In Florida, the leading phosphate-rock producing state, phosphate rock shipments in '36 increased both in quantity and value over '35, exceeding any year since '30. Shipments as usual were mostly of land pebble. Total exports of Florida rock were greater in '36, both in quantity and value, than in '35.

The quantity (in long tons) and tonnage by state, of the various kinds of phosphate rock shipped or used by producers in '35 and '36 were as follows:—

	Mine production	*Shipments*
Florida:		
Hard rock	165,958	138,859
Land pebble	2,442,520	2,454,272
Soft rock	37,341	31,769
Total 1936	2,645,819	2,624,900
1935	*2,598,337	2,422,804
Idaho and Montana:		
1936	79,152	83,135
1935	67,490	69,293
Tennessee:† (Brown, blue, and white rock):		
1936	737,866	643,822
1935	493,501	550,284
Grand total 1936	3,462,837	3,351,857
1935	*3,159,328	3,042,381

* Revised figure.

† A small quantity of apatite from Virginia is included with Tennessee.

Total exports of phosphate rock from the U. S. during '36 were 1,208,951 long tons, valued at $6,743,522, compared with 1,104,394 long tons, valued at $5,773,506 during '35.

New Norfolk Plant

Southern States Cooperative, Inc., has started constructing a $300,000 fertilizer plant on a 70-acre site in the Money Point district, south of Norfolk on the Southern branch of the Elizabeth River, where most of the fertilizer manufacturing activities in the Norfolk area are concentrated.

Jap Sulfate Needs

The Japanese Dept. of Agriculture and Forestry has instructed the Mitsui Bussan Kaisha to import 35,000 tons of sulfate.

Fertilizer Tag Sales: Season 1936-1937§

	Equivalent tons*							
	June				July-June			
	P.C. of 1936.	1937.	1936.	1935.	P.C. of 1936.	1936-37	1935-36.	1934-35.
South—								
Virginia†	217	9,125	4,204	5,895	122	457,222	374,466	360,785
North Carolina	149	30,484	20,468	13,688	120	1,217,055	1,017,829	986,198
South Carolina	126	19,515	15,523	16,266	127	776,514	613,086	619,964
Georgia	159	13,152	8,252	6,720	131	873,813	665,400	621,272
Florida	134	20,326	15,164	12,703	128	569,363	446,081	426,330
Alabama	102	9,850	9,650	4,650	133	624,200	469,500	420,250
Mississippi	119	10,545	8,847	4,300	136	330,230	242,141	205,154
Tennessee†	867	650	75	202	132	145,208	109,711	91,874
Arkansas‡	...	.....	100	825	152	¶71,706	46,706	37,330
Louisiana†	43	850	1,977	450	145	158,467	109,204	94,440
Texas†	...	300	5	125	136	86,178	63,139	59,528
Oklahoma	10	5	50	5	103	6,185	5,985	5,919
Totals, South	136	114,802	84,315	65,829	128	5,315,485	4,163,248	3,929,044
Midwest—								
Indiana	31	281	906	869	128	274,538	214,157	168,692
Illinois	94	412	437	2,692	180	50,021	27,846	22,662
Kentucky	483	313	63	63	138	110,440	80,115	71 627
Missouri	73	19	26	23	155	100,353	64,947	55,367
Kansas	...	.....	.....	.....	161	12,015	7,454	5,596
Totals, Midwest	72	1,025	1,432	3,647	139	547,367	394,519	323,944
Grand totals	135	115,827	85,747	69,476	129	5,862,852	4,557,767	4,252,988

* Monthly records of fertilizer tax tags are kept by State control officials and may be slightly larger or smaller than the actual sales of fertilizer. The figures indicate the equivalent number of short tons of fertilizer represented by the tax tags purchased and required by laws to be attached to each bag of fertilizer sold in the various States.

† Cottonseed meal sold as fertilizer included.

‡ Excludes 49,550 revised tons of cottonseed meal for July-June combined, but no separation is available for the amount of meal used as fertilizer from that used as feed.

¶ Revised.

§ Prepared by the National Fertilizer Association.

Pigments and Fillers

Raw Paints Materials Markets Seasonally Dull

Exceptionally Few Price Changes Reported—Paint Sales Heavy—Exports at Record Levels—June Construction 37% Above Year Ago—Strong Possibility of a 5,000,000 Automobile Year—

Seasonal dullness was very noticeable in the markets for raw paint materials last month. After the great number of price revisions made July 1st for the 3rd quarter but very few additional changes in quotations were reported over the balance of the month. Most important of these was the decline of turpentine to the lowest point of the season, a $2.25 per ton advance in hardwood pitch, a 5c reduction in red vermilion, and several changes in the schedules on certain of the varnish gums.

The usual seasonal decline in shipments in July was further accentuated this year by the fact that paint manufacturers, fully warned in advance of wholesale impending price advances on July 1st, took the precaution to order in heavily. The effect of this may even be felt through August and September.

Important Price Changes

ADVANCED

	July 30	June 30
Hardwood pitch	$23.75	$21.50

DECLINED

Mica, wet-ground, paint grade	$0.04½	$0.04¾
Wall or paper grades	.03¾	.04
Red Vermilion	1.75	1.80
	June '37	June '36
Exports*	$1,924	$1,554

*000, omitted, pigments, paints and varnishes.

May Sales—$45,254,635

May sales of paint, varnish, lacquer and fillers were valued at $45,254,635, according to reports by 680 establishments. This compared with a value of $46,345,474 in April and $42,727,626 in May last year. Total sales for the first 5 months were $193,402,448 against $157,306,169 in the same months last year. Net sales of plastic paints were 643,681 lbs. against 774,640 in April and 618,727 in May last year; dry cold water paints sold totaled 3,093,062 lbs. against 3,236,243 in April and 2,609,478 in May, 1936; and calcimines sold in May were 8,094,521 lbs. against 8,813,592 in April and 8,361,099 in May last year.

Exports Again Increase

May exports of paints and paint materials advanced slightly from the record level established during the preceding month to a total of $2,021,400 compared with shipments valued at $1,573,000 in May, '36, or a value gain of approximately 30%. Exports of ready mixed paints, varnishes, and lacquers totalled 473,555 gals., valued at $750,000, in May against 422,485 gals., valued at $659,700, in May, '36. In this classification export shipments of ready mixed paints increased from 216,760 gals. to 257,570; lacquers, from 172,875 gals. to 178,390 gals.; and varnishes from 32,850 gals. to 37,595 gals.

Other materials on the list recording gains in May compared with the same month last year included paste paints which increased in quantity from 164,500 lbs. to 226,800 lbs.; cold water paints from 430,000 lbs. to 1,141,250 lbs.; and chemical pigments from 13 million lbs. to 18 million lbs. Gains in the latter item was due to heavier foreign demand for American carbon black, shipments of which increased from 12,843,000 lbs. to 17,952,500 lbs.

Imports of raw and semi-manufactured materials important in the manufacture of paint products continued heavy in May reflecting the current record activity of our domestic paint, varnish and lacquer manufacturers. Compared with the corresponding month of '36 receipts of tung oil increased from 13,980,000 lbs. to 14,010,400 lbs.; flaxseed from 1,243,675 bu. to 3,662,500 bu.; and shellac and other varnish gums from 5 to 7 million lbs. Receipts of Manchurian perilla continued light, amounting to only 3,540,000 lbs. against 21,311,200 in May, '36.

Building Figures Promising

June construction work totaled $318,137,100 in value in 37 states east of the Rockies, or 8% greater than the recovery peak for July last year, according to Dodge statistics. June work was 30% over $244,112,800 over May and 37% over June, 1936. Residential building accounted for $93,123,100; non-residential building took $125,087,000. June residential building compared with $83,937,000 for May and $73,604,600 for June last year. The only sectors that failed to share in the increased residential construction were N. Y. and St. Louis. The one uncertainty in the building picture is the danger of rising costs acting as a brake on new construction. At least attention has been called to this strong possibility. A sharp and sustained increase in residential building contract awards during the remainder of the year is vital, if earlier forecasts of a 50% gain in '37 are to be realized. So far home building contracts (for the first half) are ahead by 55 to 60%. However in '36 a sharp rise occurred in the final half of the year and to overcome this figure the totals for the remaining months of '37 must jump by leaps and bounds. The probability is that home construction awards will average about 35% in '37 over the '36 figure.

Bright Outlook For Auto Finishings

Despite labor unsettlement in Detroit auto plants and the current slackening in the automobile industry for the change-over to '38 models, lacquer producers supplying the industry have enjoyed so far a very splendid year. Prospects are still favorable for a 5,000,000 car year, which would represent the second largest annual unit production in the history of the industry, the peak year's output having been 5,622,000 cars and trucks in 1929. Last year, 4,617,000 units were produced whereas the depression low was 1,431,000 in '32.

For the first half, output totaled about 2,925,000 units, an increase of around 13% over 2,594,000 units produced in the first half of last year.

It is difficult to estimate 3rd and 4th quarter production at this time. No drastic changes are expected this year so that a million units in the 3rd quarter is not an idle dream and neither is equalling the '36 final quarter figure of 1,155,000.

From the automotive areas opinions are expressed that the chances of a 5,000,000 car year are good. This means approximately 1,000,000 units each in the 3rd and 4th quarters. Some apprehension is felt over further improvement in the build-industry. Heavy construction totals are slightly disappointing. The slack caused by curtailment in PWA work is not being taken up by private construction to to the degree hoped for. Neither has private home construction expanded as rapidly as was anticipated earlier in the year.

DeLaney With A. A. C.

George B. DeLaney, until June 30th with Monsanto, in charge of lamp black sales, and previously with Wilckes, Martin & Wilckes and Swann in a similar capacity, is now in charge of sales of Cosmic Bone Black, for American Agricultural Chemical Co. Mr. DeLaney has headquarters at 204 S. Farmon ave., Detroit. Starting with Wilckes, Martin & Wilckes in 1917, making routine laboratory tests on lamp blacks, Mr. DeLaney in 1921 headed the traffic department, and also made purchases. In 1927 he was placed in charge of lamp black sales and continued in that capacity when the firm merged with Swann in '30, and when Swann merged with Monsanto in '33.

Garasche Heads Titanium

C. F. Garasche is the new president of Titanium Pigment, succeeding Ralph M. Roosevelt who has resigned. Ivan D.

Hagar, general sales manager, has been elected a vice-president.

Mr. Garasche who is only 47, received his early business training with Picher Lead and its successor, Eagle-Picher Lead. After seeing service in the World War he joined National Lead in '21 as assistant to the production manager. In '33 he was chosen vice-president and a director of National Lead's associate company, Titanium Pigment.

Mr. Hagar has been with Titanium Pigment for 16 years and only last year was elected a director of the company.

Continental Orders Tank Cars

An order for specially constructed tank cars has been placed by Continental Carbon, which recently entered the field with a new 160 acre plant at Sunray, Texas. These cars, which will be used to transport Continental's dustless carbon black, are loaded through the top and have special unloading hoppers through which the black is released to conveyors at the customer's plant. Sealed openings at the sides provide easy access for sampling. Large users of carbon black, such as the big rubber companies, have found this method of transportation not only more convenient but cleaner and more economical.

Martin Reopens Carbon Plant

The carbon black plant of L. Martin Co. of Philadelphia, at Johnsonburg, Pa., is to be placed in operation again after a 7-year shut-down.

S.-W. Declares $1 Extra

Directors of Sherwin Williams have declared an extra dividend of $1 in addition to the regular quarterly dividend of $1 on the common. Company on May 15th last, distributed a similar extra with the regular disbursement.

Chrome Yellow Paint

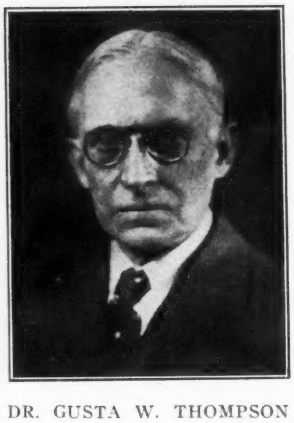
A new Federal specification (TT-P-53) for medium chrome yellow ready-mixed outside paint has been approved by the Director of Procurement in the Treasury Department, to become effective Sept. 1st. Copies of the specification may be secured from the Superintendent of Documents, Washington, at 5c each.

Meinke With Yarnell Paint

Dr. Carl W. Meinke is now technical director of the Yarnell Paint Co. He was formerly with Arco and the Jamestown Paint & Varnish Co.

Clay Production In '36

Production of clay, including Fuller's earth, in the U. S. in '36 totalled 4,013,242 short tons, valued at $15,688,434, compared with 3,151,215 tons valued at $13,054,152 in '35, according to a report of the Bureau of Mines based on data received from producers. The '36 record is higher than in any year since '30, and was below the high 1925-29 average by only 292,427 tons and $1,880,369 in value.



DR. GUSTA W. THOMPSON

National Lead's Chief Chemist who has been elected to honorary membership of the A.S.T.M.

Eagle-Picher Moves Divisions

Eagle-Picher Sales has moved the pigment and oxide division, the lead-in-oil division and the insulation division to 1 La Salle st., Chicago.

Foreign

¶ Grand Old Man of British Industry Dies in 89th year—U. S. May Exports Advance Still Further—Italy Abolishes Committees on Dyes, Fertilizers—Other Foreign News—

Prof. H. E. Armstrong, 89, dean of the British chemical industry and probably its most prominent figure, died on July 13th at his home at Lewisham. For 70 years he was a powerful influence on the course of science, the teaching of chemistry, and the application of theoretical knowledge to practical uses. He was awarded the Davy medal of the Royal Society in '11, the Messel medal of the Society of Chemical Industry in '22, and the Albert medal of the Royal Society of Arts in 1930. He was a doctor of philosophy of Leipzig University, doctor of laws of St. Andrew's, and doctor of science of Madrid and Melbourne. His son, Prof. E. F. Armstrong, is also a prominent member of the British chemical industry.

May Exports $17,637,200

Continuing the advance which has been in evidence for some time exports of chemicals and related products during May, valued at $17,337,200, were the highest for any month since '29, and compare with $15,445,000 during the preceding month and $13,799,000 in May of last year.

Every leading item on the export list except certain types of fertilizer materials, shared in the gain recorded in May, particularly naval stores, coal-tar products, chemical specialties, industrial chemicals, and paint products.

Industrial chemicals led the export list in May with shipments valued at $2,943,400 against $2,157,600 in May '36. Chemical specialties followed in point of value with export shipments valued at $2,297,000, which was 35% greater than the $1,704,700 recorded for this group in May of last year.

Naval stores, gums and resins group, which has been suffering for some time from scarcity and high cost of ocean shipping facilities, staged a remarkable recovery in May during which exports of these products aggregated $2,218,500, in value against $1,599,000 during the preceding month and $1,370,000 in May 1936. Gain in this group was due almost entirely to larger shipments of turpentine and rosin.

Aussinger Verein Profits Up

The "Aussinger Verein," the largest chemical concern in Czechoslovakia, reported a 44% increase in gross profits during '36, compared with the preceding year. The gain was due to a 20% increase in sales which resulted largely from a revival of business during the closing quarter. The dividend rate was increased from 10 to 11½%.

Demand for Liquid Rosin

Due to increased world demand for liquid rosin, Swedish output and exports of this product have increased rapidly in recent years—exports last year reaching 12,702 metric tons, against 8,418 in '35 and 5,043 metric tons in '32. Data indicates that practically the entire output is exported.

Germany to Save on Soap

With the view to promoting a more economical use of soaps in order to conserve the national supply of fats and oils, Germany has established official normsheets which give the particular type of softener suited to waters found in different parts of the country.

Italy Abolishes Committee

In line with a new policy, the functions of the Italian Nitrogen Committee and Committee for the Organic Synthetic Dye Industry, created by royal decree laws in August, '33, and January, '34, respectively, have been passed over to the corporations, according to information received by the Department of Commerce from the trade commissioner at Rome. The commission for authorizing industrial plants and the nitrogen and dyestuffs committee have been abolished.

Oakite Products has approved for the Fall season the largest autumn newspaper advertising campaign on Oakite in the history of the company.

Natural Raw Materials

Jap-China War Firms Tung Oil Prices

Shellac Market Fails to Rally—Wax Markets Dull—Larger Carnauba Output Expected—Naval Stores Prices Sink Lower —Corn Derivatives at Low Point—

For the first time in many months tung oil prices showed firmer tendencies. This is unquestionably due to the outbreak of serious hostilities between Japan and China and the possibility that the war which for the moment is confined to 5 of the northern Chinese provinces may spread and prevent shipments out of Hankow. Anticipating the present trouble shipments during June were the heaviest for that month for many years past. The rise in tung brought about sympathetic advances in oiticicia and perilla late in the month. Taking the month as a whole little price revision was noted in the domestic vegetable oils. Linseed was off slightly and the fish oils were sharply lower. What changes took place in the important animal fats and oils were within very narrow limits. A slightly bullish tone was given to the cottonseed oil market at one time last month when the June disappearance report showed much greater apparent consumption than was expected.

Dextrin, starch, tanner's corn sugar and other corn derivatives took a severe price tumble last month when the recent bullish movement in corn collapsed. Prices on these items are once again around the year's low point. Egg albumen and egg yolk each declined 1c early in the month as a result of poor demand aggravated by a heavy arrival of new crop. Wattle bark advanced sharply with a net gain of $6.75 per ton. The extract was also advanced $\frac{1}{8}$c. During the month zinc dust was "upped" $\frac{1}{4}$c; annatto seed $\frac{1}{2}$c; cochineal 3c per lb. On the other side of the ledger Myrobalans declined $1.25 per ton; sumac 50c; and valonia beards $1 per ton.

Important Price Changes

ADVANCED	July 30	June 30
Annatto seed	$ $.07\frac{3}{4}$	$ $.07\frac{1}{4}$
Cochineal, gray	.35	.32
Teneriffe	.36	.33
Wattle Bark	41.75	36.50
Extract	$.04\frac{5}{8}$	$.04\frac{3}{8}$
Zinc Dust	.089	.0865
DECLINED		
Albumen, egg	$ .52	$ .53
Dextrin, corn	4.25	4.80
British Gum	4.60	5.15
Egg Yolk	.53	.54
Myrobalans, S1	27.00	28.25
S2	19.50	20.75
Starch, corn, pearl	3.78	4.33
powd.	3.88	4.43
Sumac	58.50	59.00
Valonia beards	46.00	47.00

Little Interest in Shellac

The domestic shellac markets failed to show any stimulation last month. Prices are at the lowest point in years and buyers are still luke-warm in their interest towards forward purchasing. Yet a turn may come momentarily. Prices in the primary markets abroad showed slight improvement late in July and this may or may not be an indication of the immediate trend of the market over the next 30 days.

Wax Markets Marking Time

General dullness prevailed in the market for waxes. Carnauba prices were generally higher in July, but weakness developed late in the month when actual purchasing continued extremely light. Japan wax remains momentarily quiet, but dealers and consumers alike are viewing the Japan-China clash closely wondering just what effect a prolonged state of war would have on the commodity in this country.

Turpentine Declines to 33c

Naval stores went into another tailspin last month. Turpentine prices reached the lowest point for the season, and several of the grades of rosin also registered new lows. Analysis of the present situation is rather baffling. While sales have been light receipts at primary centers have not been so heavy as to cause the market to decline as it has. In addition, the two producers' marketing companies, organized for the purpose of relieving the market from any undue pressure, are said to be ready to function. These groups when they actually swing into action may be able to force high prices, particularly so if improvement in buying domestically and for foreign consumption takes place shortly which would tend to diminish stocks now expanding at primary ports. The changes as shown by an end-of-the-month comparison are given below:

Savannah	June 30	July 30	Net Gain or Loss
B	$8.05	$7.80	$ — 0.25
D	8.05	7.80	— 0.25
E	8.05	7.80	— 0.25
F	8.05	7.80	— 0.25
G	8.05	7.80	— 0.25
H	8.05	7.80	— 0.25
I	8.05	7.80	— 0.25
K	8.05	7.80	— 0.25
M	8.05	7.80	— 2.25
N	8.05	7.85	— 0.20
W G	8.05	7.90	— 0.15
W W	8.80	8.60	— 0.20
X	8.80	8.70	— 0.10
Stocks	55,916	73,820	+17,904
Turpentine	$0.33\frac{3}{4}$	.33	— $\frac{3}{4}$c
Stocks	27,239	33,326	+6,087
Jacksonville			
Rosin stocks	28,339	33,839	+5,500
Turpentine	29,021	31,974	+2,953
Pensacola			
Rosin stocks	20,351 (June 26)	27,644 (July 30)	+7,293
Turpentine	16,501 (June 26)	19,511 (July 24)	+3,010

Larger Carnauba Crop Expected

Brazil's output of carnauba is expected to be greater during the current season due to the severe drought in producing sections during the latter part of last year. The carnauba palm exudes greater amounts of wax following a protracted dry period. Stocks on hand at the beginning of June were reported to be heavy as poor agricultural crops in producing sections have caused farmers to devote more attention to the gathering of wax.

Murray Oil Opens New Dept.

Murray Oil Products, N. Y. City, is opening a fatty acid department with Dr. Erich Schuelke in charge. This arrangement will not interfere with the latter's operation of his own company, Colloid Chemical Laboratories.

Linseed Oil Futures

John McD. Murray, president of the N. Y. Produce Exchange, has announced that trading in linseed oil for future delivery will start on the floor of the exchange on Wednesday, Sept. 1st.

Exact hour of opening and the trading hours and time of calls will be announced later.

The contract is for 60,000 lbs. of bulk linseed oil of N. Y. Produce Exchange contract grade, which shall be raw linseed oil and to conform to the standard specifications as to "properties," adopted by the American Society for Testing Materials under the designation D-234-28. These specifications provide among other things that the oil shall be pure oil pressed from flaxseed.

Quotations will be in cents and hundredths of a cent per pound, each hundredth of a cent representing $6 per contract.

New Chemurgic Study

The senate committee on agriculture has favorably reported a bill (S. 2789), introduced by Senator Theodore G. Bilbo (Miss.), authorizing the Dept. of Agriculture to establish a regional research laboratory in one of the Southern states to study better utilization of cotton and its products and eventually many other Southern agricultural products.

Georgia Rosin Products, Savannah, suffered a loss of $50,000 July 11th when more than 500 barrels of rosin oil, a warehouse, and distilling plant shed, were destroyed by fire.

W. C. Hardesty, Inc., glycerin and fatty acids, with one plant in Wilmington, Calif., and another in Dover, Ohio, is building a new factory at 5700 E. 61st st., Los Angeles.

Financial

Stock Market Stages a Sharp Recovery in July

Gain on N. Y. Stock Exchange Totals $4,511,266,965—Chemical Stocks Appreciate $350,741,304—2nd Quarter Earnings Statements Favorable—

After several months of successive declines the stock market in July reversed its downward trend and the appreciation on the N. Y. Stock Exchange for the month totalled $4,511,266,965, while the average share quotation rose from $39.21 to $42.30.

The chemical stocks shared in the general advance, several notable gains being made. Allied was up 21¾ points, Monsanto 13 points, and Hercules Powder, 9 points. The net value of the chemical group on the N. Y. Stock Exchange on Aug. 1st amounted to $6,536,613,791, which compares with $6,185,872,487 on July 1st, or a net gain of $350,741,304 for the month. The average share price gained $3.70 in the same period or from $72.56 to $76.35.

In the representative list of leading chemical common stocks given below all made substantial gains in the past month. Chemical consumption has not only held up well over the past few months, but important tonnages of raw materials are moving into new uses. In the Street the outlook for the chemical group is well thought of.

Favorable 2nd Quarter Earnings

Second quarter earnings statements released so far make pleasant reading for holders of securities of the leading chemical companies. With but very few exceptions net earnings in the June quarter show substantial gains over the corresponding period of last year. Earnings for the first half by many of the companies in the group are at record levels with volume up between 20 to 25%.

Mathieson Alkali reports for the 2nd quarter net of $516,726 equivalent after dividend requirements on 7% preferred to 58c a share on 830,428 no-par shares of common.

This compares with $477,051 or 52c a share in preceding quarter and $428,190 or 46c in June quarter of 1936.

For six months, net income was $993,778, equal to $1.10 a share, comparing with $717,882 or 76c in first 6 months of '36.

Hercules Earnings Rise Sharply

Hercules reports for the first 6 months net earnings of $3,037,012. This is equal, after payment of $262,464 preferred dividends, to $4.70 a share on an average of 590,722 shares of common stock outstanding during the period. $2.51 a share was earned on an average of 583,865 shares of common outstanding during the first 6 months of '36.

Net earnings for the 2nd quarter were $1,561,422, which after preferred dividends is equal to $2.40 a share on an average of 595,390 shares of common outstanding during the quarter. Comparative net earnings in the 2nd quarter of '36 were $966,943, equal to $1.39 a share on the common, after payment of preferred dividends.

Regular preferred dividends and $3.00 a share on the common were paid during the first 6 months of 1937. Current assets at the end of the half year amounted to $18,957,625, as compared with current liabilities of $3,271,621. Cash and marketable securities amounted to $3,929,536.

Du Pont Reports $23,822,888

The du Pont and wholly-owned subsidiaries report for quarter ended June 30th, subject to audit and year-end adjustments, shows net income of $23,822,888 after depreciation, obsolescence, interest and federal income taxes, including provision for surtax on undistributed profits, comparing with $16,013,346 in preceding quarter and $23,978,189 in June quarter of previous year.

After deducting debenture dividends and including $641,532 company's equity in undivided profits or losses of controlled companies not wholly owned there was a balance available for common stock in June quarter of 1937, of $22,825,023 equivalent to $2.07 a share (par $20) on 11,035,037 average number of common shares outstanding during the period.

In the preceding quarter, balance for common stock, including $432,622 company's proportion in profits or losses of controlled companies not wholly owned, was $14,806,572, equal to $1.34 a share on 11,047,838 average common shares, and in June quarter of '36, a balance for common stock, including $377,280 equity in undivided profits or losses of controlled companies not wholly owned was $22,716,072, equal to $2.06 a share.

For 6 months ended June 30th, net income was $39,836,234 after charges and taxes, comparing with $38,691,971 in first half of previous year.

National Lead's Net Up 90%

Business and profits of National Lead continue to gain rapidly. For the 6 months ended June 30th net, including non-recurring income, showed an increase of about 90% over the like '36 period, while sales advanced close to 40%.

Dividends and Dates

Name	*Div.*	*Stock Record*	*Payable*
Am. Smelt. & Refg., q	75c	Aug. 6	Aug. 31
Armour (Ill.)	20c	Aug. 25	Sept. 15
Armour (Ill.), $6 pr. pf., q	$1.50	Sept. 10	Oct. 1
Armour (Ill.), 7% pf., q	$1.75	Sept. 10	Oct. 1
Armour (Del.), pf., q	$1.75	Sept. 10	Oct. 1
Atlantic Ref., q	25c	Aug. 20	Sept. 15
Colgate-Palmolive-Peet, q	12½c	Aug. 6	Sept. 1
Colgate-Palmolive-Peet, pf., q	$1.50	Sept. 4	Oct. 1
Dewey & Almy	$1.00	Aug. 5	Aug. 10
Dewey & Almy, Cl. A	$1.00	Aug. 5	Aug. 10
Dow Chem.	75c	Aug. 2	Aug. 16
Dow Chem., pf., q	$1.25	Aug. 2	Aug. 16
Eagle Picher	10c	Sept. 15	Oct. 1
Eagle Picher, pf., q	$1.50	Sept. 15	Oct. 1
Fansteel Met., $5 pf., q	**$1.25**	**Sept. 15**	**Sept. 30**
Fansteel Met., $5 pf., q	$1.25	Dec. 15	Dec. 17
Freeport Sulphur	50c	Aug. 13	Sept. 1
Freeport Sulphur, pf., q	$1.50	Oct. 15	Nov. 1
Hercules Powd., pf., q	$1.50	Aug. 3	Aug. 14
Kellogg & Sons, Spencer,* Stk. 2%		Aug. 2	Aug. 16
Libbey-Owens-Ford, q	$1.50	Aug. 31	Sept. 15
Lindsay Light, r	10c	Aug. 9	Aug. 30
Link Belt, q	50c	Aug. 14	Sept. 1
Merck	25c	Sept. 15	Oct. 1
Merck, pf., q	$1.50	Sept. 15	Oct. 1
Monsanto, q	50c	Aug. 25	Sept. 15
Monsanto, $4.50, pf. I	$1.64	Nov. 10	Dec. 1
N. J. Zinc	50c	Aug. 20	Sept. 10
Penn. Salt	$2.00	Aug. 3	Sept. 15
Penn. Salt	$2.00	Aug. 31	Sept. 15
Phillips Pet., e	25c	Aug. 6	Sept. 1
Phillips Pet., q	50c	Aug. 6	Sept. 1
Pittsburgh Plate	$2.00	July 30	Aug. 20
P. & G., q	50c	July 23	Aug. 14
Solvay Amer., 5½% pf., q	$1.37½	July 15	Aug. 16
Texas Gulf, q	50c	Sept. 1	Sept. 15
Texas Gulf Sulphur, q	50c	Sept. 1	Sept. 15
United Dyewood, pf., q	**$1.75**	**Sept. 10**	**Oct. 1**
United Dyewood, pf., q	**$1.75**	**Dec. 10**	**Jan. 3**
Westvaco Chlorine, q	25c	Aug. 10	Sept. 1

* Stockholders are given the option of taking $50 cash or 2 shares of common for each 100 shares held.

† Represents proportion of the semi-annual dividend for the unexpired period ending December 1.

Price Trend of Chemical Company Stocks

	June 30	July 2	July 9	July 16	July 23	July 31	Net Gain or less last month	Price on July 31, 1937	1937 High	1937 Low
Air Reduction	69½	70¾	73	73	74¾	71½	+ 2	79¼	80¼	64½
Allied Chemical	217½	231	228½	234	236½	239¼*	+21¾	217	258½	215
Columbian Carbon	117	120	121	...	...	121⅞a	+ 4⅞	127½	125¾	111
Commercial Solvents	13⅛	13½	14⅛	13½	14⅛	14⅛	+ 1	16½	21¼	14
du Pont	153	152	156¾	160	162	159¾	+ 6¾	165	180⅛	148½
Hercules Powder	152	...	155⅛	...	...	161*	+ 9	114	185	144⅞
Mathieson Alkali	32⅝	33¾	...	...	36¾	37*	+ 4⅜	34	41¾	32⅝
Monsanto Chemical	89	91½	96¼	98½	103	102*	+13	99¼	104	85
Std. of N. J.	65	67¼	68¼	70¾	71¾	70	+ 5	62⅛	76	63⅛
Texas Gulf Sulphur	35	35¾	36	36¼	39⅜	38½*	+ 3½	35⅞	44	33¾
Union Carbide	99¼	99⅝	102⅞	102¼	101¾	101¾	+ 2½	95¼	111	95
U. S. Ind. Alcohol	30	30¼	32	31½	31¾	32	+ 2	37	43⅝	28

* July 30th; a July 27th.

Net profit of $5,192,266 was equal to $1.36 a share on the common as compared with $2,740,927, or 57c a common share, in the like '36 period. Sales totaled $50,728,761 as contrasted with $36,607,914 in the initial half of '36. Earnings for the first 6 months of '37 reflected the inclusion of a non-recurring profit of about $1,100,000, part of which came from the payment by American Smelting & Refining on its 6% preferred stock, of which National Lead owned a large amount.

In making public the results for the first 6 months, Chairman Edward J. Cornish stated that despite the substantial improvement in earnings the board decided not to raise the common dividend because "we do need a little more working cash capital in view of the large improvements made last year and contemplated this year."

Air Reduction's Net Up

Report of Air Reduction and wholly-owned subsidiaries for quarter ended June 30th, subject to audit, shows net profit of $2,289,498 after depreciation, federal income taxes, etc., but before excess profits taxes or surtax on undistributed profits equal to 90c a share on 2,542,601 no-par shares of capital stock. This compares with $1,950,938 or 77c a share in preceding quarter and $1,902,245 or 75c a share in June quarter of previous year.

For 6 months ended June 30th, indicated net profit as compiled from company's reports totaled $4,240,437 after above deductions, equal to $1.67 a share comparing with $3,332,476 or $1.31 a share for the 6 months ended June 30, '36.

Solvents Profits Decline

Commercial Solvents reports for quarter ended June 30th, net profit of $360,606 after depreciation and federal income taxes, but before federal surtax on undistributed profits, equivalent to 14c a share on 2,636,878 shares of capital stock. This compares with $501,773 or 19c a share in preceding quarter, and $466,170 or 18c a share in June quarter of previous year.

For 6 months ended June 30th, last, net profit was $862,380 equal to 33c a share comparing with $1,083,948 or 41c a share in first half of '36.

Carbide Reports $1.16 2nd Quarter

Carbide reported a net income of $10,505,140 for the second quarter, equivalent to $1.16 a share on 9,000,743 shares outstanding.

Net income for the year to June 30, last, including certain subsidiaries, was $41,866,007, equal to $4.65 a share. This compared with $3.56 for the year to June 30, 1936, and $4.09 a share for the year to Dec. 31, '36.

Dow's Fiscal Report Off Slightly

Dow Chemical and subsidiaries for fiscal year ended May 31, 1937, certified by independent accountants, shows net profit of $4,089,113 after interest, depreciation, federal income and undistributed profits taxes, etc., and after deduction of $311,851 non-recurring cost of purchasing annuities for employes beyond the age limit of the Social Security Act. This net profit is equal after dividend requirements on the 5% preferred stock, to $4.15 a share on 945,000 shares of no-par common stock. In previous fiscal year, net profit was $4,384,510, equal after dividend requirements on the 7% preferred stock then outstanding to$4.42 a common share.*

*See page 169 this issue.

Standard's Earnings Up Sharply

Report of Standard Wholesale Phosphate & Acid, for fiscal year ended May 31, 1937, certified by independent auditors, shows profit of $305,110 after ordinary taxes, depreciation and other charges, but before federal income taxes, comparing with profit of $47,861 before federal taxes, in preceding year. Capital stock outstanding at close of fiscal year amounted to 149,663 shares (par $20) excluding 337 shares held by company.

Newport Nets $356,310

Report of Newport Industries, and subsidiary for quarter ended June 30th, subject to annual audit, shows net profit of $356,310 after depreciation, interest and normal federal income taxes, but before federal surtax on undistributed profits, equal to 68c a share on 519,347 shares of common. This compares with $409,284 or 79c a share in preceding quarter and $94,966 or 18c a share in June quarter of previous year.

Freeport Reports $1.56 per Share

Consolidated net income of Freeport Sulphur for the 6 months ended June 30th was $1,279,841 equal to $1.56 per share, Langbourne M. Williams, Jr., president, reported to directors. This compares with earnings of $1,014,872 or $1.22 a share in the like period of '36 and is the highest for any similar period since '31.

Concurrently directors declared a dividend of 50c on the common payable Sept. 1st to stockholders of record Aug. 13th. Company had previously paid 25c quarterly since the March quarter of '35. A quarterly dividend of $1.50 also was declared on the $6 preferred payable Nov. 1st to stockholders of record Oct. 15th.

Attributing company's increase in net earnings to the steady rise in industrial and agricultural demand for sulfur, Mr. Williams also pointed out that for the first time since '34 the Cuban-American Manganese Corp. chief subsidiary of the Freeport Sulphur is operating on a profitable basis and is producing high grade manganese at its plants near Santiago, Cuba, at the rate of over 10,000 tons per month.

Earnings of Cuban-American Manganese Corporation were reported as $58,854 for the first 6 months of '37 as against a net loss of $87,629 for the like period of '36. Freeport's share of these earnings amounted to $54,699 or 7c per share on Freeport common.

In commenting on the increase in net earnings of Freeport, Mr. Williams states that the accelerated pace of American business generally and increased use of sulfur in manufacturing processes and in agriculture were the factors responsible for the improved position. He cited the paper and pulp industry especially, pointing out that Freeport's sales to this group had increased 37.7% over the first 6 months of '36. He also declared that expansion in the rayon industry which is currently operating 149.7% ahead of '29 levels had created an unusual demand for sulfur as this mineral is used several times in the rayon manufacturing process.

Earnings Statements Summarized

Company:	Annual dividends	Net income 1937	Net income 1936	Common share earnings 1937	Common share earnings 1936	Surplus after dividends 1937	Surplus after dividends 1936
Atlas Powder:							
June 30 quarter	*w*$.75	$506,741	$380,619	*h*$1.68	*h*$1.11	......	......
Six months, June 30 ..	*w*.75	876,822	735,755	*h*2.78	*h*2.12	......	......
Catalin:							
Six months, June 30 ...	*y*.40	‡124,020	‡156,585	....	....	......	......
Twelve months, June 30	*y*.40	‡304,744	‡299,090	....	....	......	......
Cook Paint & Varnish:							
Six months, June 30 ...	§.60	312,509	*......	1.17	....	......	......
Freeport Sulphur:							
Six months, June 30 ..	*w*.50	1,279,841	1,014,873	1.56	1.22	*......	*......
Hercules Powder:							
June 30 quarter	6.00	1,561,422	966,943	*j*2.40	*j*1.39	......	......
Six months, June 30 ..	6.00	3,037,012	1,772,044	*j*4.70	*j*2.51	......	......
Mathieson Alkali:							
June 30 quarter	1.50	516,726	428,190	.58	.46	......	......
Six months, June 30 ..	1.50	993,778	717,882	1.10	.76	......	......
Newport Industries:							
June 30 quarter	*y*1.85	356,310	94,966	.68	.18	......	......
Six months, June 30 ..	*y*1.85	765,594	162,405	1.47	.31	......	......
Twelve months, June 30	*y*1.85	1,155,245	305,250	2.22	.59	......	......
Penick & Ford:							
June 30 quarter	*w*.25	†54,340	304,775	....	.82	*......	*......
Six months, June 30 ..	*w*.25	36,120	693,055	.10	1.87	*......	*......
Phillips Petroleum:							
**June 30 quarter ...	§2.00	7,063,443	4,180,143	*h*1.59	*h*1.01	......	......
Six months, June 30 ..	§2.00	12,679,080	7,336,302	*h*2.85	*h*1.77	......	......
Union Carbide & Carbon:							
June 30 quarter	*w*.80	10,505,140	7,936,660	1.17	.88	......	......
‡‡Six months, June 30	*w*.80	20,452,852	15,439,053	2.27	1.71	......	......
Twelve months, June 30	*w*.80	41,866.008	32,067,145	4.65	3.56	......	......

w Last dividend declared; *h* On shares outstanding at close of respective periods; *y* Amount declared in last 12 months; ‡ Profit before Federal income taxes; † Plus extras; *Not available; *j* On average shares.

Chemical Stocks and Bonds

July Last	1937 High	1937 Low	1936 High	1936 Low	1935 High	1935 Low	Sales: Number of shares July 1937	Sales: Number of shares 1937	Stocks	Par $	Shares Listed	Dividends*	Earnings** $-per share-$ 1936	Earnings** $-per share-$ 1935
NEW YORK STOCK EXCHANGE														
71½	80¼	64½	86½	58	57½	35	20,300	155,100	Air Reduction	No	2,523,065	$2.50	2.79	2.10
239¼	258½	215	245	157	173	125	9,500	83,900	Allied Chem. & Dye	No	2,214,099	6.00	11.44	8.71
95½	101½	83	89	49	57¾	41½	4,000	46,600	Amer. Agric. Chem.	No	210,934	2.50	4.71	6.37
24⅜	30¾	20½	35⅜	20⅛	35¾	22½	7,000	139,700	Amer. Com. Alcohol	20	260,947	.50	4.55	3.16
42	46	39⅝	50	37	52	36	2,800	36,000	Archer-Dan-Midland	No	549,546	3.00	3.20	3.46
75	94	68½	84	48	48½	32¾	3,200	29,200	Atlas Powder Co.	No	248,660	3.50	4.21	2.81
122	133	113¾	131	112	115	106¾	160	3,470	5% conv. cum. pfd.	100	88,781	5.00	20.86	16.93
39¼	41¼	26⅝	32¼	21¾	35⅜	19⅛	54,800	1,274,000	Celanese Corp. Amer.	No	1,000,000	1.50	2.25	1.99
111⅝	115	106½	116	106	111¼	97½	400	10,600	prior pfd.	100	164,818	7.00	27.25	35.34
18⅜	25¾	17⅞	21¼	13	21	15⅛	45,100	543,500	Colgate-Palm.-Peet	No	1,956,086	.75	1.40	1.36
102¾	104½	102	106½	100	107¼	101	800	11,000	6% pfd.	100	246,496	6.00	17.12	16.79
121⅞	125¾	111	136½	94	101¼	67	2,000	30,700	Columbian Carbon	No	537,586	5.75	7.48	5.56
14⅛	21¼	13	24⅝	14¼	23⅞	16⅛	70,100	583,300	Commercial Solvents	No	2,635,371	.80	.84	1.02
65½	71¼	54⅞	82½	63⅝	78⅜	60	18,300	176,400	Corn Products	25	2,530,000	3.75	3.86	2.62
156	157½	153	170	158	165	148¼	800	6,900	7% cum. pfd.	100	243,739	7.00	46.76	33.97
63	76⅛	60	63	42	50⅜	35⅛	900	13,900	Devoe & Rayn. A	No	95,000	2.00	4.49	2.89
122	159¼	115¾	142¼	94⅜	105½	80½	5,900	23,200	Dow Chemical	No	945,000	2.40	4.48	3.43
159¾	180⅛	148½	184¾	133	146½	86⅝	40,300	246,500	DuPont de Nemours	20	11,049,470	6.10	7.56	5.04
134¼	135½	130¼	136½	129	132	126⅞	2,200	13,700	6% cum. deb.	100	1,092,699	6.00	84.21	56.81
180	181¾	151	185	156	172¼	110½	11,400	74,000	Eastman Kodak	No	2,250,921	6.75	8.24	6.90
156	163	150	166	152	164	141	290	2,560	6% cum. pfd.	100	61,657	6.00	306.64	258.09
30¾	32¼	24¼	35⅝	23½	30⅝	17¼	40,200	204,700	Freeport Texas	10	796,380	1.00	2.43	1.78
112	117	105½	135	108	125	112½	70	950	6% conv. pfd.	100	12,[illegible]	6.00	163.38	121.30
43½	51½	40¾	55¼	39½	49½	23⅜	8,300	170,400	Glidden Co.	No	603,304	2.00	3.29	2.91
52⅞	58⅛	51½	56	52¼			1,200	15,900	4½% cum. pfd.	50	200,000	2.25	15.43	.....
117¼	117¼	100	133	99⅝	119½	85	2,200	19,300	Hazel Atlas	25	434,409	7.64	6.56	7.58
161	185	144⅞	5⅞	2⅞	90	71	1,800	17,600	Hercules Powder	No	583,672	5.44	6.33	4.23
133	135½	125	47¼	22¾	131	122	240	1,740	6% cum. pfd.	100	105,765	6.00	48.97	36.30
37¾	47½	33	66⅜	43¼	36⅜	23½	13,600	314,800	Industrial Rayon	No	606,500	2.10	2.24	1.00
55⅛	64¼	41	48¾	37	42¾	21½	1,100	4,600	Interchem.	No	288,358	2.75	3.02	2.74
110	111½	107¼	112	107	110	98½	110	730	6% pfd.	100	66,917	6.00	18.97	17.19
6	9⅛	5	30	23	5	2⅝	26,000	574,800	Intern. Agricul.	No	436,049	None	—1.55	—.99
47	63½	42	36¾	29¾	42¾	26	2,200	103,400	7% cum. pr. pfd.	100	100,000	None	.23	2.69
65⅝	73⅜	55⅛	80¼	47¼	47¼	22¾	115,700	1,290,700	Intern. Nickel	No	14,584,025	1.30	2.40	1.65
25	28¾	24	46½	32½	36¼	25	1,000	11,400	Intern. Salt	No	240,000	2.00	1.65	1.32
30⅛	36	29½	42⅜	27½	36¼	31	1,300	13,700	Kellogg (Spencer)	No	500,000	1.60	2.62	2.22
66¼	79	58½	103	79	49¼	21⅛	29,900	197,700	Libbey Owens Ford	No	2,503,168	3.50	4.15	3.26
26	27	21⅝	36½	26⅜	37¼	24⅛	8,100	85,600	Liquid Carbonic	No	684,812	.80	1.58	1.29
37	41¾	32⅝	171	155	33⅞	23¾	6,800	83,100	Mathieson Alkali	No	830,428	1.50	1.76	1.44
102	104	85	147	137¾	94¾	55	11,900	76,500	Monsanto Chem.	10	1,114,409	3.00	4.01	3.84
38¾	44	30⅜	40	9	20⅝	14⅛	33,800	335,500	National Lead	10	3,095,100	.875	1.71	1.08
157¾	171	154¾	164	125	162½	150	1,100	4,700	7% cum. "A" pfd.	100	213,793	7.00	33.83	25.40
135	150	127	56	40¼	140½	121¾	80	1,010	6% cum. "B" pfd.	100	77,462	6.00	74.50	49.05
33¼	41¾	28	122½	115¾	10⅞	4⅜	45,400	635,700	Newport Industries	1	519,347	.60	.98	.57
99⅛	99¾	82½	13	5⅝	129	80	20,600	76,600	Owens-Illinois Glass	25	1,330,602	6.00	7.53	6.52
62½	65½	55½	146	84	53¾	42⅝	18,800	77,100	Procter & Gamble	No	6,410,000	1.87	2.39	2.32
117½	118½	114½	135	126	121	115	610	2,790	5% pfd. (ser. 2-1-29)	100	171,569	5.00	94.14	88.15
13½	15⅜	10¾	41⅜	25⅝	8¾	4	21,300	343,900	Tenn. Corp.	5	853,696	.15	.47	.22
38½	44	33¾	44⅜	33	36¾	28⅜	27,000	658,000	Texas Gulf Sulphur	No	2,540,000	2.50	.....	1.94
101¾	111	95	105¼	71⅝	75⅜	44	53,300	313,900	Union Carbide & Carbon	No	8,903,138	2.30	4.09	3.06
83	91	69¾	96¾	68	78	46	6,700	57,800	United Carbon	No	397,877	4.05	5.54	4.71
32	43⅝	28	59	31⅛	50⅝	35⅛	14,600	508,600	U. S. Indus. Alco.	No	391,033	1.00	—.20	2.16
31	39⅜	24⅛	30½	16¼	21¾	11¼	21,300	656,500	Vanadium Corp.-Amer.	No	366,637	None	.40	—1.13
8¼	12¾	7	8½	4⅜	4⅝	2½	15,200	650,400	Virginia-Caro. Chem.	No	486,000	None	—2.56	—.79
56¼	74⅜	48½	58¾	28⅜	35¾	17½	7,500	225,100	6% cum. part. pfd.	100	213,392	None	.16	4.20
21½	27¼	19	32	19¾	25½	16¾	1,800	39,500	Westvaco Chlorine	No	284,962	.75	1.39	1.63
30¼	34⅞	29½	35¼	31¾			2,500	26,500	Westvaco Chlorine, cum. pfd.	30	192,000	1.50	3.26	.....
NEW YORK CURB EXCHANGE														
33⅛	35⅞	26⅝	40¾	29¼	30	15	50,800	392,500	Amer. Cyanamid "B"	No	2,404,194	1.00	1.77	1.61
1⅞	2⅞	1⅞	3¾	2⅜	4	2	300	14,100	British Celanese Am. R.	10	2,806,000	None	—4.53	—.71
116½	124	108½	116¼	99¼	115	90	675	12,100	Celanese, 7% cum. 1st pfd.	100	148,179	7.00	24.47	21.96
9½	15	7¾	16⅜	9	15	7	900	12,200	Celluloid Corp.	15	194,952	None	—.80	—.95
13⅛	14⅝	12½	15	11⅞	14½	11⅛	1,450	3,650	Courtaulds' Ltd.	1 £	24,000,000	7½%	8.40%	7.51%
9	10⅝	6¾	10¾	5	12½	6¾	3,500	53,200	Duval Texas Sulphur	No	500,000	.50	.61	.16
44	44	39½	55	39	58	37	1,400	10,900	Heyden Chem. Corp.	10	149,997	2.25	3.56	3.22
118½	147½	114½	140	98¼	97¼	46¾	6,300	44,000	Pittsburgh Plate Glass	25	2,142,443	6.00	7.15	5.32
133¾	154¾	118	154½	117	128⅞	84	4,100	37,050	Sherwin Williams	25	635,583	4.00	8.04	6.19
109	114	108	116	110	113½	106	170	2,050	5% pfd. cum.	100	155,521	5.00	41.44	33.17
PHILADELPHIA STOCK EXCHANGE														
175	179	162	179	114¼	116¾	76½	1,150	5,495	Pennsylvania Salt	50	150,000	8.50	10.59	7.74

July Last	1937 High	1937 Low	1936 High	1936 Low	1935 High	1935 Low	Sales July 1937	Sales 1937	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE													
106⅞	109½	105½	117½	107¾	116	104½	311,000	2,899,000	Amer. I. G. Chem. Conv. 5½'s	1949	5½	M. N.	29,929,000
36¾	42½	31	42½	27½	29¾	7⅜	96,000	1,654,000	Anglo Chilean Nitrate inc. deb.	1967	4½-5		12,433,000
100¾	102	100	102¾	96¾	100½	91⅛	18,000	198,000	Int. Agric. Corp. 1st Coll. tr. stpd. to 1942	1942	5	M. N.	5,994,100
34⅜	35¾	30¼	39	21	21½	7	438,000	2,319,000	Lautaro Nitrate conv. b's	1954	6	J. J.	31,357,000
25¼	25½	20¾	35	23¾	38	32⅛	2,000	24,000	Ruhr Chem. 6's	1948	6	A. O.	3,156,000
103¼	105	103	105	103	104	91½	9,000	216,000	Tenn. Corp. deb. 6's "B"	1944	6	M. S.	3,007,900
101	111	98¼	98⅛	85¾	94¾	66	71,000	1,339,000	Vanadium Corp. conv. 5's	1941	5	A. A.	4,261,000

* Paid in 1936, including extras; ** For either fiscal or calendar years.

Industrial Trends

Slight Seasonal Decline in Business Activity Reported—Steel Production Rises—Bright Outlook for Fall—Farmers' Purchasing Power at Highest Level Since '29—

Seasonal influences were quite visible in most divisions of the chemical industry last month and were most pronounced in raw fertilizer, raw paint materials, and in solvents. Shipments in July, however, were greatly in excess of the total for the same month of last year, reflecting the high rate of activity in industry generally. Following the generous number of price revisions made effective July 1st, only a few additional changes were reported during the balance of the month. Most important were the rise in nitrate of soda, the collapse in corn derivatives, the decline in turpentine to a new season's low, and lower quotations for both natural and synthetic methyl acetone.

Trends in industrial production were mixed last month. Contraction in automotive output became more apparent and the month's output is estimated around 300,000 units. Steel activity on the other hand, rebounded to 85% when the independents resumed full operations following the return of workers to the plants. Declines in operations were noted in the glass, ceramic, paint, and fertilizer industries, most sections of the textile field with the exception of rayon were slower, while little change took place in paper output. Tire manufacturers in the Akron area are momentarily marking time, but are producing more heavily in plants located in other sections of the country. Tanning operations remain rather heavy in anticipation of heavy fall demands from the shoe manufacturers. Petroleum refineries are on very heavy production schedules.

Retail sales in most sections of the country continue to run ahead of the corresponding figures for last year, although the percentages are now narrowing. On the average sales are currently but 3 to 6% ahead of '36. Wholesale trade at the moment is spotty, but a decided improvement is anticipated in August as retail outlets prepare for fall business.

Carloadings Ahead of '36

In all but one week in July carloadings ran well ahead of last year. Once again a new all-time record output of electricity was reported by the Edison Electric Institute. The generally recognized indices of business activity showed considerable fluctuation in the past month, going into new high ground for the recovery period in the second week and then receding slightly in the last two weeks.

All wholesale commodity price indices registered declines. This was largely caused by much lower prices for the grains and cotton when it became apparent that bumper crops would feature the '37 agricultural season.

More Confidence in Evidence

In most quarters the outlook for fall business is viewed optimistically. The failure of the C.I.O. strikes at the independent steel plants and the rout of the president on his Supreme Court plan have given encouragement to the more conservative elements in the country. The stock market gained in July, the first month of appreciation in values for some time. Uncertainty still persists with Congress in session, but there is hope that the house and senate will "take the bit" and force an adjournment leaving several pieces of the president's "must" legislation to be dealt with early in '38.

Bumper Crops Assured

Most encouraging feature is the purchasing power of the farmer. The wheat crop will be the most valuable in the past decade, the corn crop is a bumper one, the outlook for cotton and tobacco is bright. This means that the farmer will be in a position to purchase many goods other than necessities, and on a fairly liberal scale. That large school of economists who have been insisting that there can be no prosperity without the farmer being in good financial position, will have ample opportunity to prove the truth of their assertions this fall. Really no serious minded person doubts the necessity of having a heavy farmer purchasing power, and fortunately, the agricultural sections of the country are coming back strongly. From Chicago it is reported that already a buying wave is on, largely supported by the rural areas.

Muddled Foreign Situation

The foreign situation is still not one to generate any great amount of optimism. The Spanish war drags on with every indication that the conflict will not be brought to an end through diplomacy. Italy and England appear to be on better terms, but in the Far East Japan has started what appears to be a major conflict with China. Localizing any such operation to the two nations may prove difficult because of the wide diversity of interests in the Far East.

Statistics of Business

	June 1937	June 1936	May 1937	May 1936	April 1937	April 1936
General:						
Com. Paper outstdg. *c*	$284	$168	$286	$184	$285	......
Failures, Dun & Bradstreet	670	773	834	832	786	830
Factory Payrolls, totals†	......	......	105.1	80.8	104.9	77.9
Factory Employment†	......	......	102.2	89.8	102.1	85.1
Merchandise Imports‡	......	......	$285,038	$191,697	$287,252	$170,500
Merchandise Exports‡	......	......	$288,924	$200,772	$269,171	$164,151
Manufacturing:						
Automotive Production	......	......	516,899	460,512	536,334	502,775
Boot & Shoe Production	34,240,868	29,370,504	34,990,219	30,264,351	40,185,638	33,397,785
Bldg. Contracts Dodge*‡	$318,137	$232,665	$244,112	$216,070	$270,125	$234,632
Newsprint Production:						
Canada, tons	310,871	270,051	302,232	267,067	......	258,721
U. S., tons	78,500	79,830	79,003	75,719	......	76,470
Plate Glass Prod., sq. ft.	19,392,254	16,243,665	19,437,246	19,192,114	21,955,771	19,454,774
Steel Ingots Prod., tons	4,183,762	3,975,569	5,153,559	4,046,253	......	3,942,254
% Steel Capacity	74.46	69.83	88.82	70.91	......	69.09
Pig Iron Prod., tons	......	......	......	......	......	......
U. S. consumption crude rubber, tons	51,798	52,722	51,733	50,612	51,797	52,031
Tire Shipments	......	......	5,374,654	5,833,333	5,560,453	4,904,116
Tire Production	......	......	5,351,638	4,974,119	5,729,869	4,857,083
Tire Inventory	......	......	12,592,215	8,177,800	12,628,872	9,034,707
Chemical:						
Chemical Employment†*a*	......	......	137.5	117.2	135.6	115.8
Chemical Payrolls†*a*	......	......	151.9	111.3	150.6	109.1
Chemical Exports‡	$12,560	$9,087	$13,235	$10,512	$12,437	$9,837
Chemical Imports‡	$8,087	$5,814	$9,152	$6,381	$11,025	$7,313
Stocks, mfg. goods *x*	......	......	......	122	......	128
Stocks, raw mat. *x*	......	......	......	108	......	78

	Carloadings			Electrical Output§			Jour. of Com.	Nat'l Fertilizer Ass'n Price Indices					‡‡Labor Dept. Chem. & Drug	% Steel	N. Y. Times Index	Fisher's Index
Week Ending	1937	1936	% of Change	1937	1936	% of Change	Price Index	Chem. & Drugs	Fats & Oils	Fert. Mat.	Mixed Fert.	All Groups	Price Index	Activity	Bus. Act.	Pur. Power
June 26	773,733	713,588	+ 8.4	2,238,332	2,005,243	+11.6	91.3	93.7	75.8	72.0	77.3	87.4	83.0	75.0	107.5	108.8
July 3	806,168	649,703	+24.1	2,238,268	2,029,639	+10.3	92.1	94.6	76.2	72.7	77.3	88.3	83.1	67.3	106.7	108.1
July 10	682,205	724,277	— 5.8	2,096,266	1,956,230	+ 7.2	92.3	94.6	77.8	71.7	77.3	88.6	83.0	82.7	109.7	107.7
July 17	770,075	720,359	+ 6.9	2,298,005	2,029,704	+13.2	91.3	95.6	78.5	72.2	78.6	88.8	83.4	82.5	110.1	108.1
July 24	770,980	730,981	+ 5.0	2,258,776	2,099,712	+ 7.6	90.8	95.6	77.6	72.2	78.6	88.6	83.8	84.3	107.1	108.3
July 31	......	......	.....	....	....	.....	91.5	95.6	76.7	72.4	78.6	88.3	...	...	....	....

c 000,000 omitted, as end of month; * 37 states; † Dept. of Labor 3-year average, 1923-1925 = 100.0; ‡ 000 omitted; § K.W.H., 000 omitted; *a* Includes all allied products, but not petroleum refining; ‡‡ 1926-1928 = 100.0; *x* Dept. of Commerce; *y* Preliminary; *z* Revised.

Prices Current

Heavy Chemicals, Coal-tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Import chemicals are so designated. Resale stocks when a market factor are quoted in addition to maker's prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f. o. b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1936 Average $1.18 - Jan. 1937 $1.11 - July 1937 $1.08

	Current Market		1937 Low	1937 High	1936 Low	1936 High
Acetaldehyde, drs, c-l, wks lb.	...	.14	...	.14	...	.14
Acetaldol, 95%, 50 gal drs wks lb.	.21	.25	.21	.25	.21	.25
Acetamide, tech, lcl, kegs lb.	.32	.43	.32	.43	.38	.43
Acetanalid, tech, 150 lb bbls lb.	.24	.26	.24	.26	.24	.26
Acetic Anhydride, 100 lb cbys lb.	.20	.24	.20	.24	.21	.25
drs, f.o.b. wks, frt allowed lb.	.14	.15	.14	.15	...	.15
Acetin, tech, drs lb.	...	.33	.22	.33	.22	.24
Acetone, tks, f.o.b. wks, frt allowed lb.	...	.05	.05	.06½	.06	.11
drs, c-l, f.o.b. wks, frt allowed lb.	...	.06	.06	.07½	.07	.12
Acetyl chloride, 100 lb cbys lb.	.55	.68	.55	.68	.55	.68
ACIDS						
Abietic, kgs, bbls lb.	.09¾	.10	.06¾	.10	.06¾	.07
Acetic, 28%, 400 lb bbls, c-l, wks 100 lbs.	...	2.53	2.25	2.53	...	2.45
glacial, bbls, c-l, wks 100 lbs.	...	8.70	8.00	8.70	...	8.43
glacial, USP, bbls, c-l, wks 100 lbs.	...	10.75	10.50	12.43	...	12.43
Adipic, kgs, bbls lb.	...	.72	...	.72	...	.72
Anthranilic, ref'd, bbls lb.	.85	.95	.85	.95	.85	.95
tech, bbls lb.	...	.75	...	.75	...	.75
Battery, cbys, delv 100 lbs.	1.45	2.60	1.35	2.60	1.35	2.50
Benzoic, tech, 100 lb kgs lb.	.43	.47	.43	.47	.40	.45
USP, 100 lb kgs lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, 80 tons, bgs, delv ton *a*	...	95.00	...	95.00	...	95.00
Broenner's, bbls lb.	...	1.11	...	1.11	1.11	1.25
Butyric, edible, c-l, wks, cbys lb.	1.20	1.30	1.20	1.30	1.20	1.30
synthetic, c-l, drs, wks lb.	...	.22	...	.22	...	.22
wks, lcl lb.	...	.23	...	.23	...	.23
tks, wks lb.	...	.21	...	.21	...	.21
Camphoric, drs lb.	5.50	5.70	5.50	5.70	...	5.25
Chicago, bbls lb.	...	2.10	...	2.10	...	2.10
Chlorosulfonic, 1500 lb drs, wks lb.	.03½	.05	.03½	.05	.03½	.05
Chromic, 99¾%, drs, delv lb.	.14¾	.16¾	.14¾	.16¾	.14¾	.16¾
Citric, USP, crys, 230 lb bbls lb. *b*	.25	.26	.25	.26	.25	.29
anhyd, gran, bbls lb. *b*	...	.27½	.27½	.29	.29	.31
Cleve's, 250 lb bbls lb.	.50	.52	.50	.52	.50	.54
Cresylic, 99%, straw, HB, drs, wks, frt equal gal.	.89	.91	.72	.91	.51	.74
99%, straw, LB, drs, wks, frt equal gal.	.92	.94	.77	.94	.68	.79
resin grade, drs, wks, frt equal lb.	.10¾	.11¼	.09	.11¼	.52*y*	.65*y*
Crotonic, drs lb.	.75	1.00	.75	1.00	.90	1.00
Formic, tech, 140 lb drs lb.	.11	.13	.11	.13	.11	.13
Fumaric, bbls lb.	...	.60	...	.60	...	.60
Fuming, see Sulfuric (Oleum)						
Fuoric, tech, 90%, 100 lb. drs lb.	.35	.45	.35	.45	...	.35
Gallic, tech, bbls lb.	.65	.68	.65	.68	.65	.68
USP, bbls lb.	.77	.80	.77	.80	.70	.80
Gamma, 225 lb bbls, wks lb.	...	.85	...	.85	.80	.85
H, 225 lb bbls, wks lb.	.50	.55	.50	.55	.50	.55
Hydriodic, USP, 10% sol. cbys lb.	.50	.51	.50	.51	.50	.51
Hydrobromic, 34% com 155 lb cbys, wks lb.	.42	.44	.40	.42	...	...
Hydrochloric, see muriatic.						
Hydrocyanic, cyl, wks lb.	.80	1.30	.80	1.30	.80	1.30
Hydrofluoric, 30%, 400 lb bbls, wks lb.	.07	.07½	.07	.07½	.07	.07½
Hydrofluosilicic, 35%, 400 bbls, wks lb.	.10½	.15	.10½	.15	.11	.12
Lactic, 22%, dark, 500 lb bbls lb.	.02½	.02¾	.02½	.02¾	.02½	.05
22%, light ref'd, bbls lb.	.03½	.03¾	.03½	.03¾	.03½	.07
44%, light, 500 lb bbls lb.	.05½	.05¾	.05½	.05¾	.05½	.12
44%, dark, 500 lb bbls lb.	.06½	.06¾	.06½	.06¾	.06½	.10
50%, water white, 500 lb bbls lb.	.10½	.11½	.10½	.11½	.10½	.14½
USP X, 85%, cbys lb.	.42	.45	.42	.50	.45	.50
Laurent's, 250 lb bbls lb.	.45	.46	.45	.46	.45	.47
Linoleic, bbls lb.	...	.20	.16	.20	.16	.16
Maleic, powd, kgs lb.	.30	.40	.29	.40	.29	.32
Malic, powd, kgs lb.	.45	.60	.45	.60	.45	.60
Metanillic, 250 lb bbls lb.	.60	.65	.60	.65	.60	.65
Mixed, tks, wks N unit	.06½	.07¼	.06½	.07¼	.06½	.07¼
S unit	.008	.009	.008	.009	.008	.009
Monochloracetic, tech, bbls lb.	.16	.18	.16	.18	.16	.18
Monosulfonic, bbls lb.	1.50	1.60	1.50	1.60	1.50	1.60

a Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls. *y* Price given is per gal.

	Current Market		1937 Low	1937 High	1936 Low	1936 High
Muriatic, 18°, 120 lb cbys, c-l, wks 100 lb.	...	1.50	1.35	1.50	...	1.35
tks, wks 100 lb.	...	1.00	.	1.00	...	1.00
20°, cbys, c-l, wks 100 lb.	...	1.75	1.45	1.75	...	1.45
tks, wks 100 lb.	...	1.10	.	1.10	1.10	1.20
22°, c-l, cbys, wks 100 lb.	...	2.25	1.95	2.25	...	1.95
tks, wks 100 lb.	...	1.60	...	1.60	...	1.60
CP, cbys lb.	.06½	.07⅛	.06½	.07⅛	.06½	.07⅛
N & W, 250 lb bbls lb.	.85	.87	.85	.87	.85	.87
Naphthenic, 240-280 s.v., drs lb.	.10	.13	.10	.14	.11	.14
Sludges, drs lb.	...	.05	.05	.10	.06	.10
Naphthionic, tech, 250 lb bbls lb.	.60	.65	.60	.65	.60	.65
Nitric, 36°, 135 lb cbys, c-l, wks 100 lb. *c*	...	5.00	...	5.00	...	5.00
38°, c-l, cbys, wks 100 lb. *c*	...	5.50	...	5.50	...	5.50
40°, cbys, c-l, wks 100 lb. *c*	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks 100 lb. *c*	...	6.50	...	6.50	...	6.50
CP, cbys, delv lb.	.11½	.12½	.11½	.12½	.11½	.12½
Oxalic, 300 lb bbls, wks, or N. Y. lb.	.10¾	.12	.10¾	.12	.10¾	.12½
Phosphoric, 50%, USP, cbys lb.	.12	.14	.12	.14	.14	.14
50%, acid, c-l, drs, wks lb.	.06	.08	.06	.08	.06	.08
75%, acid, c-l, drs, wks lb.	.09	.10½	.09	.10½	.09	.10½
Picramic, 300 lb bbls, wks lb.	.65	.70	.65	.70	.65	.70
Picric, kgs, wks lb.	.35	.40	.35	.40	.30	.40
Propionic, 98% wks, drs lb.	...	.20	.20	.22	...	.35
80% lb.	.16	.17½	.16	.17½	.15	.17½
Pyrogallic, crys, kgs, wks lb.	1.55	1.60	1.55	1.65	1.55	1.65
Ricinoleic, bbls lb.	...	.38	.35	.38	...	...
Salicylic, tech, 125 lb bbls, wks lb.	...	.33	...	.33	...	.40
Sebacic, tech, drs, wks lb.	...	.58	...	.58	...	.58
Succinic, bbls lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb bbls, wks lb.	.17	.18	.17	.18	.17	.19
Sulfuric, 60°, tks, wks ton	..	12.00	..	12.00	11.00	12.00
c-l, cbys, wks 100 lb.	...	1.25	1.10	1.25	...	1.10
66°, tks, wks ton	...	15.50	...	15.50	...	15.50
c-l, cbys, wks 100 lb.	...	1.35	...	1.35	...	1.35
CP, cbys, wks lb.	.06½	.07½	.06½	.07½	.06½	.07½
Fuming (Oleum) 20% tks, wks ton	...	18.50	...	18.50	.	18.50
Tannic, tech, 300 lb bbls lb	.26	.32	.19	.36	.19	.40
Tartaric, USP, gran, powd, 300 lb bbls lb.	.24¾	.25¼	.21¾	.25¼	.22¾	.24
Tobias, 250 lb bbls lb.	.65	.67	.65	.67	.65	.72½
Trichloroacetic bottles lb.	2.00	2.50	2.00	2.50	2.45	2.75
kgs lb.	...	1.75	...	1.75	...	1.75
Tungstic, tech, bbls lb.	...	2.75	2.50	2.75	1.50	1.60
Vanadic, drs, wks lb.	1.10	1.20	1.10	1.20	1.10	1.20
Albumen, light flake, 225 lb bbls lb.	.52	.60	.47	.60	.50	.60
dark, bbls lb.	.11	.15	.11	.17	.12	.17
egg, edible lb.	...	1.05	.76	1.05	.77	1.05
vegetable, edible lb.	.74	.78	.76	.78	.65	.70
ALCOHOLS						
Alcohol, Amyl (from Pentane) tks, delv lb.	...	.123	...	.123	.123	.143
c-l, drs, delv lb.	...	.133	...	.133	.133	.150
lcl, drs, delv lb.	...	.143	...	.143	.143	.157
Amyl, secondary, tks, delv lb.	...	.08½	...	.08½	.08½	.108
Benzyl, cans lb.	.70	1.10	.65	1.10	.65	1.10
Butyl, normal, tks, f.o.b. wks, frt allowed lb. *d*	...	.09	.08½	.09	.08½	.11
c-l, drs, f.o.b. wks, frt allowed lb. *d*	...	.10	.09½	.10	.09½	.12
Butyl, secondary, tks, delv lb. *d*	...	.07	...	.07	.07	.096
c-l, drs, delv lb. *d*	...	.08	...	.08	.08	.106
Capryl, drs, tech, wks lb.	...	.85	...	.85	...	.85
Cinnamic, bottles lb.	2.50	3.65	2.50	3.65	2.50	3.65
Denatured, CD, No. 1*, 12, 13, c-l, drs, wks gal. *e*	...	.35	.33	.35	.30	.44*
Western schedule, c-l, wks gal. *e*	...	.28	.37	.39	.39	.52*
Denatured, SD, No. 1, tks	...	.27	.26	.27	.23	.28
c-l, drs, wks gal. *e*	...	.33	.32	.33	.29	.34
Diacetone, tech, tks, delv lb. *f*	...	.11½	...	.11½	...	.16
c-l, drs, delv lb. *f*	...	.12½	...	.12½	...	.17
Ethyl, 190 proof, molasses, tks gal. *g*	...	4.06	4.05	4.07	4.07	4.10
c-l, drs gal. *g*	...	4.12	4.11	4.12	4.11	4.27
c-l, bbls gal. *g*	...	4.13	4.12	4.13	4.12	4.28
absolute, drs gal. *g*	4.54	6.08½	4.54	6.08½	4.54	6.11½

c Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher; *e* Anhydrous is 5c higher in each case; *f* Pure prices are 1c higher in each case; * Dealers were given 20% off this price.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

Prices—Current

	Current Market		1937		1936	
			Low	High	Low	High
Alcohols (continued)						
Furfuryl, tech, 500 lb drs lb.	.30	.35	.30	.35	...	.35
Hexyl, secondary tks, delv lb.	...	.12	.11½	.12	...	.11½
c-l, drs, delv .... lb.	...	.13	.12½	.13	...	.12½
Normal, drs, wks .... lb.	3.25	3.50	3.25	3.50	3.25	3.50
Isoamyl, prim, cans, wks lb.	...	.32	...	.32	...	.32
drs, lcl, delvd .... lb.	...	.27	...	.27	...	.27
Isobutyl, ref'd, lcl, drs .. lb.	...	.10	...	.10	.10	.12
c-l, drs .... lb.	...	.09½	...	.09½	.09½	.11½
tks .... lb.	...	.08½	...	.08½	.08½	.10½
Isopropyl, refd, c-l, drs, f.o.b. wks, frt allowed .. lb.	...	.39½	.39½	.45	.45	.55
Propyl, norm, 50 gal drs gal.	...	.75	.	.75	...	.75
Special Solvent, tks, wks gal.	...	.28	.27	.28	.24	.32
Aldehyde ammonia, 100 gal drs .... lb.	.80	.82	.80	.82	.80	.82
Alphanaphthol, crude, 300 lb bbls .... lb.	..	.52	...	.52	.52	.65
Alphanaphthylamine, 350 lb bbls .... lb.	.32	.34	.32	.34	.32	.34
Alum, ammonia, lump, c-l, bbls, wks ...... 100 lb.	...	3.25	3.00	3.25	...	3.00
delv NY., Phila .. 100 lb.	...	3.40	3.15	3.40	...	3.15
less than 25 bbls, wks 100 lb.	...	3.50	3.25	3.50	...	3.25
Granular, c-l, bbls. wks .... 100 lb.	...	3.00	2.75	3.00	...	2.75
Powd, c-l, bbls, wks 100 lb.	...	3.40	3.15	3.40	...	3.15
Chrome, bbls .... 100 lb.	7.00	7.25	7.00	7.25	7.00	7.25
Potash, lump, c-l, bbls, wks .... 100 lb.	...	3.50	3.25	3.50	...	3.25
25 bbls or more, wks 100 lb.	...	3.75	3.40	3.75	...	3.40
Granular, c-l, bbls, wks .... 100 lb.	...	3.25	3.00	3.25	...	3.40
25 bbls or more, bbls, wks .... 100 lb.	...	3.50	3.25	3.50	...	3.00
Powd, c-l, bbls, wks 100 lb.	...	3.65	3.40	3.65	...	3.40
25 bbls or more, wks 100 lb.	...	3.90	3.55	3.90	...	3.55
Soda, bbls, wks .... 100 lb.	...	3.25	...	3.25	...	...
Aluminum metal, c-l, NY 100 lb.	...	20.00	19.00	20.00	19.00	20.00
Acetate, CP, 20%, bbls lb.	.09	.10	.09	.10	.09	.10
Chloride anhyd, 99%, wks lb.	.07	.12	.07	.12	.07	.12
93%, wks .... lb.	.05	.08	.05	.08	.05	.08
Crystals, c-l, drs, wks lb.	.06	.06¼	.06	.06¼	.06	.07
Solution, drs, wks .... lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.03½
Hydrate, 96%, light, 90 lb bbls, delv .... lb.	.13	.15	.13	.15	.13	.15
heavy, bbls, wks ..... lb.	.029	.03½	.029	.03½	.029	.04½
Oleate, drs .... lb.	.16¾	.18½	.16¾	.18½	.15¾	.18½
Palmitate, bbls .... lb.	.22	.23	.22	.23	.21	.22
Resinate, pp., bbls ..... lb.	...	.15	...	.15	...	.15
Stearate, 100 lb bbls ... lb.	.19	.21	.19	.21	.18	.21
Sulfate, com, c-l, bgs, wks .... 100 lb.	...	1.35	...	1.35	...	1.35
c-l, bbls, wks ..... 100 lb.	...	1.55	...	1.55	...	1.55
Sulfate, iron-free, c-l, bgs, wks .... 100 lb.	...	1.90	...	1.90	...	1.90
c-l, bbls, wks .... 100 lb.	...	2.05	...	2.05	...	2.05
Aminoazobenzene, 110 lb kgs .... lb.	...	1.15	...	1.15	...	1.15
Ammonia anhyd com, tks .. lb.	.04½	.05½	.04½	.05½	.04½	.05½
Ammonia anhyd, 100 lb cyl lb.	.16	.22	.16	.22	.15¼	.22
26°, 800 lb drs, delv ... lb.	.02¼	.02½	.02¼	.02½	.02¼	.03
Aqua 26°, tks, NH .. cont.	...	.05	.04½	.05	.04½	.05
tk wagon .... lb.	...	.02	...	.02	.02	.024
Ammonium Acetate, kgs .. lb.	.26	.33	.26	.33	.26	.33
Bicarbonate, bbls, f.o.b. wks .... 100 lb.	5.15	5.71	5.15	5.71	5.15	5.71
Bifluoride, 300 lb bbls .. lb.	.16	.17	.16	.17	.15	.17
carbonate, tech, 500 lb bbls .... lb.	.08	.12	.08	.12	.08	.12
Chloride, White, 100 lb bbls, wks .... 100 lb.	4.45	4.90	4.45	4.90	4.45	4.90
Gray, 250 lb bbls, wks .... 100 lb.	5.50	6.25	5.00	6.25	5.00	5.75
Lump, 500 lbs cks spot lb.	.10½	.11	.10½	.11	.10½	.11
Lactate, 500 lb bbls .... lb.	.15	.16	.15	.16	.15	.16
Laurate, bbls .... lb.	...	.23	...	...	...	...
Linoleate .... lb.	...	.15	.11	.15	.11	.12
Naphthenate, bbls ..... lb.	...	.17	...	...	...	...
Nitrate, tech, cks ..... lb.	.03¾	.04	.03¾	.04	.04	.05
Oleate, drs .... lb.	...	.15	.15	.10	...	.10
Oxalate, neut, cryst, powd, bbls .... lb.	...	.22½	.22½	.23	.26	.27
pure, cryst, bbls, kgs .. lb.	.27	.28	.27	.28	.27	.28
Perchlorate, kgs .... lb.	...	.16	...	.16	...	.16
Persulfate, 112 lb kgs .. lb.	.21	.24	.21	.24	.21	.25
Phosphate, dibasic tech, powd, 325 lb bbls .... lb.	.07½	.10	.07½	.10	.07½	.10
Ricinoleate, bbls ...... lb.	...	.15	...	...	...	...
Stearate, anhyd, bbls ... lb.	...	.24	...	...	...	...
Paste, bbls .... lb.	...	.07½	...	...	...	...
Sulfate, dom, f.o.b., bulk ton	...	26.50	26.00	27.00	22.00	26.00
200 lb bgs .... ton	...	nom.	...	nom.	...	nom.
100 lb bgs .... lb.	...	nom.	...	nom.	...	nom.
Sulfocyanide, kgs ...... lb.	...	.55	...	.55	...	.55
Amyl Acetate (from pentane) tks, delv .... lb.	...	.11½	...	.11½	.11½	.13½
tech, drs, delv ...... lb.	.11½	.12	.11½	.13½	.12½	.149
Secondary, tks, delv .. lb.	...	.08½	...	.08½	...	.108
c-l, drs, delv .... lb.	...	.09½	...	.09½	.11[illegible]	.123
Chloride, norm, drs, wks lb.	.56	.68	.56	.68	.56	.68
mixed, drs, wks ...... lb.	.07	.077	.07	.077	.07	.077
tks, wks .... lb.	...	.06	...	.06	...	.06
Mercaptan, drs, wks .... lb.	...	1.10	...	1.10	...	1.10
Oleate, lcl, wks, drs .... lb.	...	.25	...	.25	...	...
Stearate, lcl, wks, drs .. lb.	...	.26	...	.26	...	...

g Grain alcohol 20c a gal. higher in each case.

	Current Market		1937		1936	
			Low	High	Low	High
Amylene, drs, wks .... lb.	.102	.11	.102	.11	.102	.11
tks, wks .... lb.	...	.09	...	.09	...	.09
Aniline Oil, 960 lb drs and tks .... lb.	.15	.17½	.15	.17½	.15	.17½
Annatto fine .... lb.	.34	.37	.34	.37	.34	.37
Anthracene, 80% .... lb.	...	.75	...	.75	...	.75
40% .... lb.	...	.18	...	.18	...	.18
Anthraquinone, sublimed, 125 lb bbls .... lb.	...	.65	.50	.65	.50	.52
Antimony metal slabs, ton lots .... lb.	...	.15⅜	.13⅝	.17	.11⅜	.14
Butter of, see Chloride.						
Chloride, soln cbys ..... lb.	...	.17	...	.17	.13	.17
Needle, powd, bbls ..... lb.	.16½	.18½	.14	.19½	.11	.12½
Oxide, 500 lb bbls ..... lb.	.15½	.16½	.14¼	.16½	.12¾	.14
Salt, 63% to 65%, tins .. lb.	.23¾	.24	.22	.24	.22	.24
Sulfuret, golden, bbls ... lb.	.22	.23	.22	.23	.22	.23
Archil, conc, 600 lb bbls .. lb.	.21	.27	.21	.27	.21	.27
Double, 600 lb bbls ..... lb.	.18	.20	.18	.20	.18	.20
Aroclors, wks .... lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbl .... lb.	.08½	.09	.08½	.09¾	.08¾	.09¾
Arsenic, Metal .... lb.	.42	.44	.42	.44	.40	.44
Red, 224 lb cs kgs ..... lb.	...	.15¾	...	.15¾	...	.15¾
White, 112 lb kgs ...... lb.	.03	.04	.03	.04	.03	.04½
Barium Carbonate precip, 200 lb bgs, wks ..... ton	52.50	62.50	52.50	62.50	56.50	61.00
Nat (witherite) 90% gr, c-l, wks, bgs ...... ton	...	44.00	42.00	45.00	42.00	45.00
Chlorate, 112 lb kgs, N Y .... lb.	.16½	.17½	.16½	.17½	.15½	.17½
Chloride, 600 lb bbls, wks .... ton	72.00	74.00	72.00	74.00	72.00	74.00
Dioxide, 88%, 690 lb drs .... lb.	.11	.12	.11	.12	.11	.12
Hydrate, 500 lb bbls .... lb.	.04¾	.05½	.04¾	.05½	.05¼	.06
Nitrate, bbls .... lb.	.07	.08¼	.07	.08¼	.07	.08¼
Barytes, floated, 350 lb bbls wks .... ton	...	23.65	23.65	23.65	23.65	23.65
Bauxite, bulk, mines ..... ton	7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, No. 1, bgs, wks .... ton	...	16.00	...	16.00	...	16.50
No. 2 .... ton	...	11.00	...	11.00	...	11.00
Benzaldehyde, tech, 945 lb drs, wks .... lb.	.60	.62	.60	.62	.60	.62
Benzene (Benzol), 90%, Ind, 8000 gal tks, frt allowed .... gal.	...	.16	...	.16	.16	.18
90% c-l, drs .... gal.	...	.21	...	.21	...	.23
Ind pure, tks, frt allowed .... gal.	...	.16	...	.16	.16	.18
Benzidine Base, dry, 250 lb bbls .... lb.	.70	.72	.70	.72	.70	.74
Benzoyl Chloride, 500 lb drs .... lb.	.40	.45	.40	.45	.40	.45
Benzyl Chloride, tech, drs .. lb.	.30	.40	.30	.40	.30	.40
Beta-Naphthol, 250 lb bbl, wks .... lb.	.23	.24	.23	.24	.24	.27
Naphthylamine, sublimed, 200 lb bbls .... lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech, 200 lb bbls .... lb.	.51	.52	.51	.52	.51	.55
Bismuth metal .... lb.	1.00	1.10	1.00	1.10	1.00	1.10
Chloride, boxes .... lb.	3.20	3.25	3.20	3.25	3.20	3.25
Hydroxide, boxes ...... lb.	3.15	3.20	3.15	3.20	3.15	3.20
Oxychloride, boxes ..... lb.	...	2.95	2.75	3.04	2.95	3.00
Subbenzoate, boxes ..... lb.	3.25	3.30	3.25	3.30	3.25	3.30
Subcarbonate, kgs ...... lb.	1.23	1.58	1.23	1.58	1.40	1.45
Trioxide, powd, boxes ... lb.	...	3.57	3.45	3.57	3.45	3.50
Subnitrate .... lb.	1.22	1.48	1.22	1.48	1.30	1.35
Blackstrap, cane (see Molasses, Blackstrap).						
Blanc Fixe, 400 lb bbls, wks .... ton *h*	40.00	75.00	40.00	75.00	42.50	70.00
Bleaching Powder, 800 lb drs, c-l, wks, contract .. 100 lb.	...	2.00	...	2.00	...	2.00
lcl, drs, wks .... lb.	2.25	3.60	2.25	3.60	2.25	3.60
Blood, dried, f.o.b., NY .. unit	...	3.50	3.50	4.30	2.50	4.25
Chicago, high grade ... unit	...	3.25	3.25	4.65	2.90	4.50
Imported shipt .... unit	...	3.60	3.60	4.10	2.60	3.75
Blues, Bronze Chinese Milori Prussian Soluble ..... lb.	.36	.37	.36	.37	.37	.38½
Ultramarine,* dry, wks, bbls .... lb.	...	.10	...	.10	...	.10
Regular grade, group 1 lb.	...	.15	...	.15	...	.15
Special, group 1 ..... lb.	...	.18	...	.18	...	.18
Pulp, No. 1 .... lb.	...	.26	...	.26	...	.26
Bone, 4½ + 50% raw, Chicago .... ton	29.00	30.00	26.00	28.00	20.00	25.00
Bone Ash, 100 lb kgs ..... lb.	.06	.07	.06	.07	.06	.07
Black, 200 lb bbls ...... lb.	.06½	.08¼	.05½	.08¼	.05½	.08¼
Meal, 3% & 50%, imp .. ton	...	26.50	25.00	27.50	23.00	26.00
Domestic, bgs, Chicago ton	25.00	27.00	19.00	27.00	16.00	20.00

BORAX

	Current Market		1937		1936	
			Low	High	Low	High
Borax, tech, gran, 80 ton lots, sacks, delv .... ton *i*	...	42.00	40.00	42.00	...	40.00
bbls, delv .... ton *i*	...	52.00	50.00	52.00	...	50.00
Tech, powd, 80 ton lots, sacks .... ton *i*	...	47.00	45.00	47.00	...	45.00
bbls, delv .... ton *i*	...	57.00	56.00	57.00	...	56.00
Bordeaux Mixture, consumers, East, c-l, tins, drs, cases .... lb.	.10½	.11	.10½	.11	.08	.16
Dealers, East, c-l ...... lb.	.10	.10½	.10	.10½	.08½	.16½

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; * Freight is equalized in each case with nearest producing point.

		Current Market		1937 Low	1937 High	1936 Low	1936 High
Bromine, cases	lb.	.30	.43	.30	.43	.30	.43
Bronze, Al, pwd, 300 lb drs	lb.	.90½	.92½	.80	1.50	.80	1.50
Gold, blk	lb.	.45	.65	.40	.65	.40	.55
Butanes, com 16-32° group 3 tks	lb.	.02¼	.03¾	.02¼	.03¾	...	.04
Butyl, Acetate, norm drs, frt allowed	lb.	.10	.10½	.10	.10½	.09½	.12½
tks, frt allowed	lb.	...	.09	...	.09	.08½	.11
Secondary, tks, frt allowed	lb.	...	.07	.07	.07½	.07½	.096
drs, frt, allowed	lb.	.08	.08½	.08	.09	.106	.111
Aldehyde, 50 gal drs, wks	lb.	...	.17½	.16½	.17½	.19	.21
Carbinol, norm drs, wks	lb.	.60	.75	.60	.75	.60	.75
Lactate	lb.	.22½	.23½	.22½	.23½	.22½	.23½
Oleate, drs, frt allowed	lb.	...	.25	...	.25	...	...
Propionate, drs	lb.	.18	.18½	.18	.18½	.18	.18½
tks, delv	lb.	...	.17	...	.17	...	.17
Stearate, 50 gal drs	lb.	...	.26	.25	.26	...	.26
Tartrate, drs	lb.	.55	.60	.55	.60	.55	.60
Butyraldehyde, drs, lcl, wks	lb.	...	.35½	...	.35½	...	...
Cadmium Metal	lb.	...	1.20	1.05	1.20	.75	1.05
Sulfide, boxes	lb.	.90	1.00	.90	1.00	.90	1.10
CALCIUM							
Calcium, Acetate, 150 lb bgs c-l, delv	100 lb.	...	2.25	2.10	2.25	...	2.10
Arsenate, jobbers, East of Rocky Mts, drs	lb.	.06¼	.06⅜	.06	.06⅜	.06	.06⅜
dealers, drs	lb.	.06¾	.07¾	.06¼	.07¾	.06¼	.07¾
South, dealers, drs	lb.	.06½	.06¾	.06½	.06¾	.06½	.06¾
Carbide, drs	lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bgs c-l	lb.	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, flake, 375 lb drs, c-l, delv	ton	...	22.00	...	22.00	...	22.00
Solid, 650 lb drs, c-l, delv	ton	...	20.00	...	20.00	...	20.00
Ferrocyanide, 350 lb bbls wks	lb.	...	.17	...	.17	...	.17
Gluconate, Pharm, 125 lb bbls	lb.	.50	.57	.50	.57	.50	.57
Nitrate, 100 lb bgs	ton	...	26.10	...	26.10	...	26.50
Palmitate, bbls	lb.	.22	.23	.22	.23	.21	.22
Phosphate, tech, 450 lb bbls	lb.	.06½	.07½	.06½	.07½	.07½	.08
Resinate, precip, bbls	lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls	lb.	.19	.21	.19	.21	.18	.21
Camphor, slabs	lb.	...	.55	...	.55	.50	.56
Powder	lb.	...	.55	...	.55	.4940	.56
Camwood, Bk, ground bbls	lb.	.16	.18	.16	.18	.16	.18
Carbon Bisulfide, 500 lb drs	lb.	.05	.05¾	.05	.05¾	.05¼	.08
Black, c-l, bgs, delv, price varying with zone	lb.	.0445	.0535	.0445	.0535	.0445	.0535
lcl, bgs, delv, all zones	lb.	...	.07	...	.07	...	.07
cartons, delv	lb.	...	.07¾	...	.07¾	...	.07¾
cases, delv	lb.	...	.08¼	...	.08¼	...	.08¼
Decolorizing, drs, c-l	lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq 20-25 lb cyl	lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, 1400 lb drs, delv	lb.	.05¼	.06	.05¼	.06	.05¼	.06
Casein, Standard, Dom, grd	lb.	.13	.14	.13	.20¾	.14½	.20¾
80-100 mesh, c-l, bgs	lb.	.13½	.14½	.13½	.21¼	.15	.21¼
Castor Pomace, 5½ NH_3, c-l, bgs, wks	ton	...	25.00	23.00	25.00	15.00	20.00
Imported, ship, bgs	ton	...	nom.	...	nom.	17.00	18.00
Celluloid, Scraps, ivory cs	lb.	.12	.15	.12	.15	.17	.18
Transparent, cs	lb.	.12	.13	.12	.13	...	.20
Cellulose, Acetate, 50 lb kgs	lb.	...	.40	.40	.55	.55	.60
Chalk, dropped, 175 lb bbls	lb.	.03	.03¾	.03	.03¾	.03	.03¾
Precip, heavy, 560 lb cks	lb.	.03	.04	.03	.04	.03	.04
Light, 250 lb cks	lb.	.03¼	.04	.03	.04	.03	.04
Charcoal, Hardwood, lump, blk, wks	bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv*	ton	23.00	34.00	23.00	34.40	23.00	34.00
Willow, powd, 100 lb bbl, wks	lb.	.06	.07	.06	.07	.06	.06¼
Chestnut, clarified, tks, wks	lb.	...	.02125	.01625	.02125	.01625	.01⅞
25%, bbls, wks	lb.	...	.0225	.02	.0225	.01½	.02
Pwd, 60%, 100 lb bgs, wks	lb.	...	.04⅞	...	.04⅞	...	.04⅞
China Clay, c-l, blk mines	ton	...	6.50	...	6.50	...	7.00
Imported, lump, blk	ton	22.00	25.00	22.00	25.00	15.00	25.00
Chlorine, cyls, lcl, wks, contract	lb.	.07½	.08½	.07½	.08½	.07½	.08½
cyls, c-l, contract	lb. *j*	...	.05½	...	.05½	...	.05½
Liq, tk, wks, contract	100 lb.	...	2.15	...	2.15	...	2.15
Multi, c-l, cyls, wks, cont	lb.	2.30	2.55	2.30	2.55	2.30	2.55
Chloroacetophenone, tins, wks	lb.	3.00	3.50	3.00	3.50	...	3.00
Chlorobenzene, Mono, 100 lb drs, lcl, wks	lb.	.06	.07½	.06	.07½	.06	.07½
Chloroform, tech, 1000 lb drs	lb.	.20	.21	.20	.21	.20	.21
USP, 25 lb tins	lb.	.30	.31	.30	.31	.30	.31
Chloropicrin; comml cyls	lb.	...	.80	...	.80	.85	.90
Chrome, Green, CP	lb.	.21	.24	.20	.24	.21½	.23
Yellow	lb.	.14½	.15½	.13	.16½	.11	.14
Chromium, Acetate, 8% Chrome, bbls	lb.	.05	.08	.05	.08	.06	.08
20° soln, 400 lb bbls	lb.	...	.05½	...	.05½	...	.05½
Fluoride, powd, 400 lb bbl	lb.	.27	.28	.27	.28	.27	.28

j A delivered price; * Depends upon point of delivery.

Current

Coal Tar
Dinitrotoluene

	Current Market		1937 Low	1937 High	1936 Low	1936 High
Coal tar, bbls .... bbl.	7.00	8.00	6.75	9.00	7.25	9.00
Cobalt Acetate, bbls ...... lb.	.66	.68	.58	.68	..58	.60
Carbonate tech, bbls .... lb.	...	1.63	1.42¾	1.63	1.35	1.48
Hydrate, bbls .... lb.	...	1.78	1.60	1.78	1.66	1.76
Linoleate, solid, bbls ... lb.	...	.33	.31	.33	.30	.31¼
Oxide, black, bgs ...... lb.	...	1.67	1.41	1.67	1.29	1.49
Resinate, fused, bbls ... lb.	...	.13½	.13	.13½	.12½	.13
Precipitated, bbls .... lb.	...	.34	.30½	.34	...	.32
Cochineal, gray or bk bgs .. lb.	.32	.36	.32	.36	.32	.36
Teneriffe silver, bgs .... lb.	.33	.37	.33	.37	.33	.37
Copper, metal, electrol 100 lb.	...	14.00	13.00	16.25	9.50	12.00
Carbonate, 400 lb bbls .. lb.	.10½	.12½	.10½	.12½	...	.08¼
52-54% bbls .... lb.	...	.18	.16¼	.19	.14½	.16¼
Chloride, 250 lb bbls ... lb.	.15	.17	.15	.18	.17	.18
Cyanide, 100 lb drs .... lb.	.37	.38	.37	.38	.37	.38
Oleate, precip, bbls ..... lb.	...	.20	...	.20	...	.20
Oxide, black, bbls, wks .. lb.	...	nom.	.17½	.18	.14½	.15¾
red 100 lb bbls .... lb.	...	nom.	.17	.18	.14	.15
Resinate, precip, bbls ... lb.	.15	.16	.15	.19	.18	.19
Stearate, precip, bbls ... lb.	.23	.24	.23	.40	.35	.40
Sub-acetate verdigris, 400 lb bbls .... lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks 100 lb.	...	5.15	4.55	6.00	3.85	4.55
Copperas, crys and sugar bulk c-l, wks .... ton	12.00	13.00	12.00	13.00	13.00	16.00
Corn Sugar, tanners, bbls 100 lb.	...	3.79	3.74	4.34	3.08	4.03
Corn Syrup, 42°, bbls .. 100 lb.	...	3.91	3.76	4.36	3.05	3.95
43°, bbls .... 100 lb.	...	3.96	3.86	4.41	3.10	4.05
Cotton, Soluble, wet, 100 lb bbls .... lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, USP, powd & gran, 300 lb bbls ..... lb.	.18¾	.19¼	.15	.19¼	.15	.16¾
Creosote, USP, 42 lb cbys lb.	.45	.47	.45	.47	.45	.47
Oil, Grade 1, tks ...... gal.	.13½	.14	.13	.14	.12½	.13½
Grade 2 .... gal.	.118	.128	.113	.128	.109	.12
Cresol, USP, drs .... lb.	.12½	.13	.10	.13	.10	.10½
Crotonaldehyde, 98%, drs, wks .... lb.	.26	.30	.26	.30	.26	.30
Cutch, Philippine, 100 lb bale lb.	.04	.04¾	.04	.04¾	.04	.04¾
Cyanamid, bgs, c-l, frt allowed Ammonia unit	...	1.15	1.10	1.15	1.07½	1.10
Derris root 5% rotenone, bbls .... lb.	.39	.47	.39	.47	...	...
Dextrin, corn, 140 lb bgs f.o.b., Chicago ... 100 lb.	4.25	4.45	4.25	5.00	3.45	5.00
British Gum, bgs ... 100 lb.	4.60	4.70	4.60	5.25	3.70	5.40
Potato, Yellow, 220 lb bgs lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¾
White, 220 lb bgs, lcl lb.	.08	.09	.08	.09	.08	.09
Tapioca, 200 bgs, lcl ... lb.	...	.08	...	.08	...	.08
White, 140 lb bgs .. 100 lb.	4.30	4.58	4.30	4.58	3.40	4.95
Diamylamine, c-l, drs, wks lb.	.47	.75	.47	.75	.75	1.00
Diamylene, drs, wks ...... lb.	.095	.102	.095	.102	.095	.102
tks, wks .... lb.	...	.08½	...	.08½	...	.08½
Diamylether, wks, drs .... lb.	.085	.092	.085	.092	.085	.092
tks, wks .... lb.	...	.075	...	.075	...	.075
Oxalate, lcl, drs, wks .. lb.	...	.30	...	.30	...	...
Diamylphthalate, drs, wks lb.	.20½	.21	.19	.21½	.18	.19½
Diamyl Sulfide, drs, wks .. lb.	...	1.10	...	1.10	...	1.10
Dianisidine, bbls .... lb.	2.25	2.45	2.25	2.45	2.25	2.45
Dibutoxy Ethyl Phthalate, drs, wks .... lb.	...	.35	...	.35	...	...
Dibutyl Ether, drs, wks, lcl lb.	...	.30	...	.30	...	...
Dibutylphthalate, drs, wks, frt allowed .... lb.	...	.21	.19½	.21	.18	.21
Dibutyltartrate, 50 gal drs lb.	.35	.40	.35	.50	.35	.40
Dichlorethylene, drs ..... gal.	.29	...	.29	...	.29	...
Dichloroethylether, 50 gal drs, wks .... lb.	.15	.16	.15	.16	.16	.17
tks, wks .... lb.	...	.14	...	.14	...	.15
Dichloromethane, drs, wks lb.	...	.23	...	.23	...	.23
Dichloropentanes, drs, wks lb.	no prices		no prices		.032	.040
tks, wks .... lb.	no prices		no prices		...	.02½
Diethanolamine, tks, wks .. lb.	...	.25	.25	.35	...	.30
Diethylamine, 400 lb drs .. lb.	2.75	3.00	2.75	3.00	2.75	3.00
Diethylaniline, 850 lb drs .. lb.	.50	.52	.50	.52	.50	.55
Diethyl Carbinol, drs ..... lb.	.60	.75	.60	.75	.60	.75
Diethylcarbonate, com drs lb.	.31⅛	.35	.31⅛	.35	.31⅛	.35
90% grade, drs .... lb.	...	.25	...	.25	...	.25
Diethylorthotoluidin, drs .. lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, 1000 lb drs lb.	.19	.19½	.18	.19½	.18	.19
Diethylsulfate, tech, drs, wks, lcl .... lb.	...	.20	...	.20	...	.20
Diethyleneglycol, drs ..... lb.	.22	.23	.16½	.23	.15½	.17½
Mono ethyl ethers, drs .. lb.	.16	.17	.16	.17	.15	.17
tks, wks .... lb.	...	.15	...	.15	...	.15
Mono butyl ether, drs .. lb.	...	.26	...	.26	...	.26
Diethylene oxide, 50 gal drs, wks .... lb.	.20	.24	.20	.24	.20	.24
Diglycol Oleate, bbls ..... lb.	...	.21	.21	.24	...	.24
Laurate, bbls .... lb.	...	.27½	...	...	...	...
Stearate, bbls .... lb.	...	.27½	...	...	...	...
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis .... lb.	...	1.00	...	.95	...	.95
Dimethylaniline, 340 lb drs lb.	.26	.27	.26	.27	.26	.30
Dimethyl Ethyl Carbinol, drs lb	.60	.75	.60	.75	.60	.75
Dimethyl phthalate, drs, wks, frt allowed .... lb.	...	.21	.20½	.21	.19½	.21½
Dimethysulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls lb. *k*	.16	.19	.16	.19	.16	.19½
Dinitrochlorobenzene, 400 lb bbls .... lb.	.16½	.17½	.16	.17½	.14	.15½
Dinitronaphthalene, 350 lb bbls .... lb.	.35	.38	.35	.38	.34	.37
Dinitrophenol, 350 lb bbls lb.	.23	.24	.23	.24	.23	.24
Dinitrotoluene, 300 lb bbls lb.	.14½	.15½	.14½	.15½	.14½	.16½

k Higher price is for purified material.

Diphenyl
Glue, Casein

Prices

	Current Market		1937 Low	1937 High	1936 Low	1936 High
Diphenyl, bbls ....lb.	.15	.25	.15	.25	.15	.25
Diphenylamine ....lb.	.31	.32	.31	.32	.31	.32
Diphenylguanidine, 100 lb drs ....lb.	.35	.37	.35	.37	.35	.37
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt ton	34.00	nom.	34.00	nom.	32.00	45.00
Extract ....lb.	.05	.05½	.05	.05½	.05	.05½
EGG YOLK						
Egg Yolk, dom., 200 lb cases lb.	.68	nom.	.68	nom.	.63	.68
Imported ....lb.	.53	.55	.53	.57	.48	.56
Epsom Salt, tech, 300 lb bbls c-l NY ....100 lb.	1.90	2.10	1.80	2.10	1.80	2.00
USP, c-l, bbls ......100 lb.	...	2.10	2.00	2.10	...	2.00
Ether, USP anaesthesia 55 lb drs ....lb.	.22	.23	.22	.23	.22	.23
(Conc) ....lb.	.09	.10	.09	.10	.09	.10
Isopropyl 50 gal drs ....lb.	.07	.08	.07	.08	.07	.08
tks, frt allowed ......lb.	...	.06	...	.06	...	.06
Nitrous, conc, bottles ...lb.	...	.68	.68	.77	.75	.77
Synthetic, wks, drs .....lb.	.08	.09	.08	.09	.08	.09
Ethyl Acetate, 85% Ester tks, frt alld ....lb.	...	.06½	...	.06½	.06½	.08
drs, frt alld ....lb.	...	.07½	...	.07½	.07½	.09
95%, tks, frt allowed..lb.	...	.06¾	...	.06¾	.07	.08½
drs, frt alld ....lb.	...	.07¾	...	.07¾	.08	.10
Acetoacetate, 110 gal drs lb.	...	.27½	...	.27½	.37	.68
Benzylaniline, 300 lb drs lb.	.86	.88	.86	.88	.86	.88
Bromide, tech, drs .....lb.	.50	.55	.50	.55	.50	.55
Chloride, 200 lb drs ....lb.	.22	.24	.22	.24	.22	.24
Chlorocarbonate, cbys ...lb.	...	.30	...	.30	...	.30
Crotonate, drs ....lb.	1.00	1.25	1.00	1.25	1.00	1.25
Formate, drs, frt allowed lb.	.27	.28	.27	.31	...	...
Lactate, drs, wks ......lb.	...	.33	...	.33	.25	.29
Methyl Ketone, 50 gal drs, frt allowed ....lb.	.07	.07½	.07	.07½	.07	.09
tks, frt allowed ......lb.	...	.06½	...	.06½	.06½	.07½
Oxalate, drs, wks ......lb.	.30	.34	.30	.34	.37½	.55
Oxybutyrate, 50 gal drs, wks ....lb.	.30	.30½	.30	.30½	.30	.30½
Silicate, drs, wks ......lb.	...	.77	...	.77	...	...
Ethylene Dibromide, 60 lb drs ....lb.	.65	.70	.65	.70	.65	.70
Chloryhdrin, 40%, 10 gal cbys chloro, cont .....lb.	.75	.85	.75	.85	.75	.85
Anhydrous ....lb.	...	.75	...	.75	...	.75
Dichloride, 50 gal drs, wks lb.	.0545	.0994	.0545	.0994	.0545	.0994
Glycol, 50 gal drs, wks lb.	.17	.21	.17	.21	.17	.21
tks, wks ....lb.	...	.16	...	.16	...	.16
Mono Butyl Ether, drs, wks ....lb.	.20	.21	.20	.21	.20	.21
tks, wks ....lb.	...	.19	...	.19	...	.19
Mono Ethyl Ether, drs, wks ....lb.	.16	.17	.16	.17	.16	.17
tks, wks ....lb.	...	.15	...	.15	...	.15
Mono Ethyl Ether Acetate, drs, wks ......lb.	...	.14	...	.14	.14	.18½
tks, wks ....lb.	...	.13	...	.13	.13	.16½
Mono, Methyl Ether, drs wks ....lb.	.18	.22	.18	.22	.19	.23
tks, wks ....lb.	...	.17	...	.17	...	.18
Oxide, cyl ....lb.	.50	.55	.50	.55	.50	.60
Ethylidenaniline ....lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, blk pottery ....ton	...	14.50	...	14.50	...	14.50
Powd, blk, wks ....ton	14.00	14.50	14.00	14.50	14.00	14.50
Ferric Chloride, tech, crys, 475 lb bbls ....lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Fish Scrap, dried, unground, wks ....unit *l*	...	4.00	3.75	4.25	2.50	3.50
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis ....unit *m*	...	3.10	3.10	3.15	...	2.25
Fluorspar, 98%, bgs .....lb.	no prices		no prices		30.00	35.50
Formaldehyde, USP, 400 lb bbls, wks ....lb.	.05¾	.06¼	.05¾	.06¼	.05¾	.07
Fossil Flour ....lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, blk, mines..ton	**6.50**	**15.00**	**6.50**	**15.00**	**6.50**	**15.00**
Imp powd, c-l, bgs ....ton	23.00	30.00	23.00	30.00	23.00	30.00
Furfural (tech) drs, wks..lb.	.10	.15	.10	.15	.10	.15
Furfuramide (tech) 100 lb drs ....lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.16	.18	.16	.18	.16	.18
Fustic, crystals, 100 lb boxes ....lb.	.22	.26	.20	.26	.20	.23
Liquid 50°, 600 lb bbls..lb.	.09½	.13	.08½	.13	.08½	.12
Solid, 50 lb boxes ......lb.	.17½	.19½	.16	.19½	.16	.18
G SALT PASTE						
G Salt paste, 360 lb bbls...lb.	.45	.47	.45	.47	.45	.47
Gall Extract ....lb.	.19	.20	.19	.20	.18	.20
Gambier, com 200 lb bgs..lb.	...	nom.	...	nom.	...	.06
Singapore cubes, 150 lb bgs ....100 lb.	...	.10½	.09½	.10½	.08	.09
Gelatin, tech, 100 lb cs ...lb.	.50	.55	.50	.55	.50	.55
Glauber's Salt, tech, c-l, bgs, wks* ....100 lb.	.95	1.15	.95	1.15	.95	1.30
Anhydrous, see Sodium Sulfate.						
Glue, bone, com grades, c-l bgs ....lb.	.11	.17½	.11	.17½	.10½	.17½
Better grades, c-l, bgs lb.	.12½	.17½	.12½	.17½	.12	.17½
Casein, kgs ....lb.	.18	.22	.18	.22	.18	.22

l + 10; *m* + 50; *Bbls. are 20c higher.

Current

Glycerin
Gum, Hemlock

	Current Market		1937 Low	1937 High	1936 Low	1936 High
Glycerin, CP, 550 lb drs . . lb.	.21½	.22	.21½	.29	.16	.21½
Dynamite, 100 lb drs . . . lb.	.21½	.22	.21½	.29	.13¾	.21½
Saponification, drs . . . . . lb.	.16	.16½	.15½	.29	.10¼	.22
Soap Lye, drs . . . . lb.	.14½	.15	.14	.27	.09¼	.20
Glyceryl Bori-Borate, bbls lb.	...	.40	...	...	...	...
Monoricinoleate, bbls . . . lb.	...	.27	...	...	...	...
Monostearate, bbls . . . . . lb.	...	.30	...	...	...	...
Oleate, bbls . . . . lb.	...	.22	...	...	...	...
Phthalate . . . . lb.	...	.37	.29	.37	.28	.29
Glyceryl Stearate, bbls . . . lb.	...	.18	...	.18	...	.18
Glycol Bori-Borate, bbls . . lb.	...	.26	...	...	...	...
Phthalate, drs . . . . lb.	...	.40	.29	.40	.29	.35
Stearate, drs . . . . lb.	...	.27½	.23	.27½	...	.23

GUMS

	Current Market		1937 Low	1937 High	1936 Low	1936 High
Gum Aloes, Barbadoes . . . . lb.	.85	.90	.85	.90	.85	.90
Arabic, amber sorts . . . . . . lb.	.13¾	.14	.10½	.15½	.09	.10¾
White sorts, No. 1, bgs . . lb.	.29	.30	.27	.30	.25	.28
No. 2, bgs . . . . lb.	.27	.28	.25	.28	.24	.26
Powd, bbls . . . . lb.	.16½	.17	.14	.19	.13	.14
Asphaltum, Barbadoes (Man-jak) 200 lb bgs, f.o.b., NY . . . . lb.	.02½	.10½	.02½	.10½	.02½	.10½
California, f.o.b., NY, drs ton	29.00	55.00	29.00	55.00	29.00	55.00
Egyptian, 200 lb cases, f.o.b., NY . . . . lb.	.12	.15	.12	.15	.12	.15
Benzoin Sumatra, USP, 120 lb cases . . . . lb.	.22	.25	.16	.25	.15	.19
Copal, Congo, 112 lb bgs, clean, opaque . . . . lb.	...	.19¼	.18⅞	.19¼	.18½	.20
Dark amber . . . . lb.	...	.08¼	.06⅞	.08¼	.06⅞	.08
Light amber . . . . lb.	...	.13⅛	.10¼	.13⅛	.10¼	.14⅛
Copal, East India, 180 lb bgs						
Macassar pale bold . . . . . lb.	...	.13	...	.13	.12⅝	.14
Chips . . . . lb.	...	.06½	...	.06½	.06⅛	.06½
Dust . . . . lb.	.03⅝	.04⅛	.03⅝	.04⅛	.03⅝	.04⅛
Nubs . . . . lb.	...	.11¼	...	.11¼	.10⅜	.11⅛
Singapore, Bold . . . . lb.	...	.15⅝	...	.15⅝	.15⅛	.16⅞
Chips . . . . lb.	...	.04¾	.04¼	.05	.04⅜	.05¼
Dust . . . . lb.	.03⅝	.04⅛	.03⅝	.04⅛	.03⅝	.04⅛
Nubs . . . . lb.	...	.10⅜	.10⅜	.10¾	.10	.11¼
Copal Manilla, 180-190 lb baskets, Loba A . . . . . lb.	...	.10⅛	.09¾	.10⅛	.09¼	.13
Loba B . . . . lb.	...	.09¾	.09¼	.09¾	.08⅞	.12
Loba C . . . . lb.	...	.09⅜	.08⅞	.09⅜	.08⅜	.11⅛
DBB . . . . lb.	...	.08⅜	.08	.08⅜	.07⅝	.08⅞
Dust . . . . lb.	...	.06⅝	.05¾	.06⅝	.05	.06⅛
MA sorts . . . . lb.	...	.07¼	.06¾	.07¼	.06¾	.07⅝
Copal Pontianak, 224 lb cases, bold genuine . . . . lb.	...	.16	.15½	.16	.14¼	.16
Chips . . . . lb.	...	.10¼	.09⅛	.11⅛	.07	.08½
Mixed . . . . lb.	...	.14	.13½	.14	.13¼	.13¾
Nubs . . . . lb.	...	.12⅞	.12¾	.13½	.10¼	.12
Split . . . . lb.	...	.15¼	.13½	.15¼	.12¾	.13
Dammar Batavia, 136 lb cases						
A . . . . lb.	...	.24	.23½	.24	.21⅜	.22¼
B . . . . lb.	...	.22½	.22⅛	.22½	.20⅜	.21½
C . . . . lb.	...	.18⅞	.18½	.18⅞	.16½	.17⅝
D . . . . lb.	...	.16⅛	.15¼	.16⅛	.13⅝	.14⅜
A/D . . . . lb.	...	.18⅞	.17⅝	.18⅞	.15½	.17⅛
A/E . . . . lb.	...	.16⅛	.14⅞	.16⅛	.12⅞	.14½
E . . . . lb.	...	.08⅛	.07½	.08⅛	.06¾	.07⅛
F . . . . lb.	...	.06¾	.06¼	.06¾	.05⅞	.06⅞
Singapore, No. 1 . . . . . . lb.	...	.21¼	.17⅛	.21¼	.16¼	.17½
No. 2 . . . . lb.	...	.16¼	.14⅛	.16¼	.13	.14¼
No. 3 . . . . lb.	...	.05¾	..	.05¾	.05¼	.05¾
Chips . . . . lb.	...	.12	.10¼	.12	.09¾	.09¾
Dust . . . . lb.	...	.05¾	.05¾	.06	.04¼	.05⅝
Seeds . . . . lb.	.	.09½	.07⅞	.09½	.06⅝	.07⅜
Elemi, cons . . . . lb.	.09⅜	.09½	.09⅜	.10¼	.09¾	.10¼
Ester . . . . lb.	.10	.10½	.10	.12	.07⅝	.10
Gamboge, pipe, cases . . . lb.	.58	.59	.58	.59	.58	.59
Powd, bbls . . . . lb.	.65	.66	.65	.66	.65	.66
Ghatti, sol. bgs . . . . lb.	.11	.15	.11	.15	.11	.15
Karaya, powd, bbls, xxx . . lb.	.27	.30	.24	.30	.24	.25
xx . . . . lb.	.18	.19	.16	.19	.16	.17
No. 1 . . . . lb.	.12	.13	.09½	.13	.09½	.10
No. 2 . . . . lb.	.11	.12	.08½	.12	.08½	.09
Kauri, NY, San Francisco, Brown XXX, cases . . . . lb.	.60	.60½	.60	.60½	.60	.60½
BX . . . . lb.	...	.38	.33	.38	.33	.33½
B1 . . . . lb.	...	.28	.21	.28	.19	.21
B2 . . . . lb.	...	.24	.15½	.26	.14½	.15½
B3 . . . . lb.	...	.18½	.12	.18½	.12	.12½
Pale XXX . . . . lb.	...	.61	.61	.65½	.65	.65½
No. 1 . . . . lb.	...	.41	.40	.41	.40	.40½
No. 2 . . . . lb.	...	.24	.22	.24	.22	.22½
No. 3 . . . . lb.	...	.17¾	.15	.17¾	.15	.15½
Kino, tins . . . . lb.	1.60	1.70	.70	1.70	.70	.80
Mastic . . . . lb.	.57	.58	.57	.58	.56	.60½
Sandarac, prime quality, 200 lb bgs & 300 lb cks . . . lb.	.33	.35	.33	.35	.19½	.38
Senegal, picked bgs . . . . . . lb.	.27	.29	.20	.29	.20	.21
Sorts . . . . lb.	.14½	.15	.09¾	.15	.09¾	.12½
Thus, bbls . . . . 280 lbs.	...	13.75	12.00	13.75	11.00	12.00
Strained . . . . 280 lbs.	.	13.75	12.00	13.75	11.00	12.00
Tragacanth, No. 1, cases . . lb.	2.75	3.00	2.40	3.25	1.20	2.50
No. 2 . . . . lb.	2.40	2.75	2.00	2.75	1.10	2.10
No. 3 . . . . lb.	2.35	2.70	1.95	2.70	.95	2.05
No. 4 . . . . lb.	2.30	2.65	1.85	2.65	.85	1.95
No. 5 . . . . lb.	2.25	2.50	1.65	2.50	.75	1.75
Yacca, bgs . . . . lb.	...	.04½	.03¼	.04½	.03¼	.03¾
Helium, cyl (200 cu. ft.) cyl.	...	25.00	.	25.00	.	25.00
Hematine crystals.400 lb bbls lb.	.18	.34	.16	.34	.16	.34
Hemlock, 25%, 600 lb bbls, wks . . . . lb.	.03	.03¼	.03	.03¼	...	.02⅞
tks . . . . lb.	...	.02¾	...	.02¾	...	.02½

	Current Market		1937 Low	1937 High	1936 Low	1936 High
Hexalene, 50 gal drs, wks lb.	...	.30	...	.30	...	.30
Hexane, normal 60-70° C. Group 3, tks gal.	...	.10½	...	.10½	...	.12
Hexamethylenetetramine, powd, drs lb.	.35	.36	.35	.36	.35	.39
Hexyl Acetate, secondary, delv, drs lb.	.13	.13½	.13	.13½	.13	.13½
tks lb.	...	.12	...	.12	...	.11½
Hoof Meal, f.o.b. Chicago unit	...	3.50	3.50	3.75	2.35	3.00
Hydrogen Peroxide, 100 vol, 140 lb cbys lb.	.20	.21	.20	.21	.20	.21
Hydroxyamine Hydrochloride lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls lb.	.16	.21	.15	.21	.17	.20
INDIGO						
Indigo, Bengal, bbls lb.	...	2.40	...	2.40	...	...
Synthetic, liquid lb.	.16½	.19	.16½	.19	.13	.14
Iodine, Resublimed, kgs lb.	1.50	1.60	1.50	1.60	1.50	1.75
Irish Moss, ord, bales lb.	.11	.12	.11	.12	.09	.10
Bleached, prime, bales lb.	.19	.20	.19	.21	.18	.19
Iron Acetate Liq. 17°, bbls lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride.						
Nitrate, coml, bbls 100 lb.	2.32	3.11	2.32	3.25	2.75	3.25
Isobutyl Carbinol (128-132°C) drs, wks lb.	.33	.34	.33	.34	.33	.34
tks, wks lb.	...	.32	...	.32	...	.32
Isopropyl Acetate, tks, frt allowed lb.	...	.06½	...	.06½	.06	.07½
drs, frt allowed lb.	.07½	.08	.07½	.08	.07	.09
Ether, see Ether, isopropyl.						
Keiselguhr, 95 lb bgs, NY, Brown ton	60.00	70.00	60.00	70.00	60.00	70.00
LEAD ACETATE						
Lead Acetate, f.o.b. NY, bbls, White, broken lb.	...	.13½	.11½	.13½	.11	.11½
cryst, bbls lb.	...	.13½	.11½	.13½	.10½	.11½
gran, bbls lb.	...	.14¼	.12¼	.14¼	.11	.12¼
powd, bbls lb.	...	.14¼	.12¼	.14¼	.11¼	.12¼
Arsenate, East, drs lb.	.11½	.12	.11	.12	.09	.10
West, drs lb.	.11½	.12	.11	.12½	.09	.09¾
Linoleate, solid, bbls lb.	...	.19	.18	.19	.18	.26½
Metal, c-l, NY 100 lb.	...	6.00	6.00	7.05	4.50	6.00
Nitrate, 500 lb bbls, wks lb.	.11	.11½	.09	.11½	.09	.09½
Oleate, bbls lb.	.18½	.20	.15	.20	.15	.16
Red, dry, 95% Pb_3O_4, delv lb.	...	.08½	.08½	.0945	.07	.085
97% Pb_3O_4, delv lb.	...	.09¼	.08¾	.09¾	.07¼	.08¾
98% Pb_3O_4, delv lb.	...	.09½	.09	.10	.07½	.09
Resinate, precip, bbls lb.	...	.16½	.14	.16½	...	.14
Stearate, bbls lb.	.22	.23	.22	.23	.22	.23
Titanate, bbls, c-l, f.o.b. wks, frt allowed lb.	...	.12	.10	.12	...	...
White, 500 lb bbls, wks lb.	...	.07½	.07¼	.09	.06½	.07¼
Basic sulfate, 500 lb bbls, wks lb.	...	.07	.06¾	.08¾	.06	.06½
Lime, chemical quicklime, f.o.b., wks, bulk ton	6.00	8.00	6.00	8.00	7.00	7.25
Hydrated, f.o.b., wks ton	8.00	12.00	8.00	12.00	8.50	12.00
Lime Salts, see Calcium Salts.						
Lime sulfur, dealers, tks gal.	...	.11	...	.11	...	.11
drs gal.	.13	.16	.13	.16	.13	.16
Linseed Meal, bgs ton	...	38.00	35.00	42.50	29.00	40.50
Litharge, coml, delv, bbls lb.	...	.07½	.07½	.08½	.06	.075
Lithopone, dom, ordinary, delv, bgs lb.	.04⅜	.04⅝	.04¼	.04⅝	.04¼	.04¾
bbls lb.	.04⅝	.04⅞	.04½	.04⅞	.04½	.05
High strength, bgs lb.	.05⅞	.06⅛	.05¾	.06⅛	.05¾	.06¼
bbls lb.	.06⅛	.06⅜	.06	.06⅜	.06	.06½
Titanated, bgs lb.	.05⅞	.06⅛	.05¾	.06⅛	.05¾	.06¼
bbls lb.	.06⅛	.06⅜	.06	.06⅜	.06	.06½
Logwood, 51°, 600 lb bbls lb.	.09½	.11½	.08½	.11½	.06½	.10½
Solid, 50 lb boxes lb.	.15	.19	.15	.17½	.13½	.17½
Sticks ton	24.00	25.00	24.00	25.00	24.00	26.00
MADDER						
Madder, Dutch lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl ton	60.00	65.00	60.00	65.00	60.00	65.00
Magnesium Carb, tech, 70 lb bgs, wks lb.	.06¼	.07	.06	.07	.06	.06½
Chloride flake, 375 lb drs, c-l, wks ton	39.00	42.00	39.00	42.00	36.00	42.00
Fluosilicate, crys, 400 lb bbls, wks lb.	.10	.10½	.10	.10½	.10	.10½
Oxide, USP, light, 100 lb bbls lb.	.36	.40	.36	.40	...	.42
Heavy, 250 lb bbls lb.	...	.50	...	.50	...	.50
Palmitate, bbls lb.	.33	nom.	.33	nom.	.23	.24
Silicofluoride, bbls lb.	.09½	.10½	.09½	.10½	...	...
Stearate, bbls lb.	.21	.24	.21	.24	.20	.24
Manganese acetate, drs lb.	...	.26½	.25½	.26½	...	...
Borate, 30%, 200 lb bbls lb.	.15	.16	.15	.16	.15	.16
Chloride, 600 lb cks lb.	.09	.12	.09	.12	.09	.12
Dioxide, tech (peroxide), paper bgs, c-l ton	...	47.50	...	47.50	...	47.50
Hydrate, bbls lb.	...	.32	...	.32	...	...
Linoleate, liq, drs lb.	.18	.19¼	.18	.19¼	...	...
solid, precip, bbls lb.	...	.19	.17½	.19	...	...
Resinate, fused, bbls lb.	.08¼	.08½	.08¼	.08½	...	...
precip, drs lb.	...	.12	...	.12	...	...
Sulfate, tech, anhyd, 90-95%, 550 lb drs lb.	.07	.07½	.07	.07½	...	...
Mangrove, 55%, 400 lb bbls lb.	...	.04	...	.04	...	.04
Bark, African ton	25.50	26.00	25.50	27.00	25.50	27.00

	Current Market	1937 Low	1937 High	1936 Low	1936 High
Mannitol, pure cryst, cs, wks lb.	...	1.48	...	1.48	1.48	1.60
Marble Flour, blk ...... ton	12.00	13.00	12.00	13.00	12.00	13.00
Mercury chloride (Calomel) lb.	1.59	1.60	1.05	1.60	.81	1.20
Mercury metal ...76 lb. flasks	94.00	95.00	92.00	99.00	73.50	95.00
Meta-nitro-aniline .... lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls .... lb.	1.45	1.55	1.45	1.55	1.40	1.55
Meta-phenylene-diamine 300 lb bbls .... lb.	.80	.84	.80	.84	.80	.84
Meta-toluene-diamine, 300 lb bbls .... lb.	.65	.67	.65	.67	.65	.69
Methanol, denat, grd, drs, c-l, frt all'd .... gal.	...	.44	.44	.53	...	...
tanks, frt all'd ...... gal.	...	.38	.38	.48	...	...
Pure, drs, c-l, frt all'd gal.	...	.38	...	.38	...	...
tanks .... gal.	...	.33	...	.33	...	...
95%, tks .... gal.	...	.31	...	.31	...	...
97%, tks .... gal.	...	.32	...	.32	...	...
Methyl Acetate, dom, 98-100%, drs .... lb.	.16	.17⅓	.16	.17½	.11	.18⅓
Acetone, frt all'd, drs gal. *p*	.39	.45	.39	.58½	.45½	.68½
tks, frt allowed, drs gal. *p*	.33	.37	.33	.44½	.41	.48
Synthetic, frt all'd, east of Rock M., drs .... gal. *p*	.42	.51	.42	.59½	.52½	.60
tks, frt all'd .... gal.	.36	.39½	.36	.49½	.48	.53
West of Rocky M., frt all'd, drs gal. *p*	...	.46	.46	.58	.55½	.69
tks, frt all'd gal. *p*	...	.39½	.39½	.51	.51	.63½
Anthraquinone .... lb.	.65	.67	.65	.67	.65	.67
Butyl Ketone, tks ...... lb.	...	.10⅓	...	.10⅓	...	.10⅓
Chloride, 90 lb cyl ..... lb.	.32	.40	.32	.43	...	.45
Ethyl Ketone, tks ...... lb.	.	.07⅓	.	.07⅓	...	.07⅓
Formate, drs, frt allowed lb.	.35	.36	.35	.39	...	...
Hexyl Ketone, pure, drs lb.	...	.60	...	.60	...	.60
Lactate, drs, frt allowed lb.	...	.30	...	.30	...	...
Propyl carbinol, drs .... lb.	.60	.75	.60	.75	.60	.75
Mica, dry grd, bgs, wks .. lb.	35.00	...	35.00	...	35.00	...
Michler's Ketone, kgs .... lb.	...	2.50	...	2.50	...	2.50
Molasses, blackstrap, tks, f.o.b. NY .... gal.	...	.07¼	.	.07¼	.07	.08¼
Monoamylamine, c-l, drs, wks lb.	.52	1.00	.52	1.00	...	1.00
Monochlorobenzene, see Chlorobenzene, mono.						
Monoethanolamine, tks, wks lb.	...	.25	.25	.30	...	.30
Monomethylamine, drs, frt all'd, E. Mississippi, c-l .. lb.	...	.65	...	.65	...	...
Monomethylparaminosulfate, 100 lb drs .... lb.	3.75	4.00	3.75	4.00	3.75	4.00
Myrobalans 25%, liq bbls .. lb.	...	.04¼	...	.04¼		.04¼
50% Solid, 50 lb boxes lb.	.06	.06¼	.06	.06¼	.06	.06¼
J1 bgs .... ton	...	27.00	26.50	29.50	22.00	26.50
J2 bgs .... ton	...	19.50	19.00	20.75	14.25	16.75
R2 bgs .... ton	...	19.00	18.75	20.25	14.00	16.25
NAPHTHA						
Naphtha, v.m.& p. (deodorized) see petroleum solvents.						
Naphtha, Solvent, water-white, tks .... gal.	...	.31	...	.31	...	.31
drs, c-l .... gal.	...	.36	...	.36	...	.36
NAPHTHALENE						
Naphthalene, dom, crude, bgs, wks .... lb.	...	2.50	2.00	3.00	2.75	4.50
Imported, cif, bgs .... lb.	...	2.25	2.25	3.00	...	...
Balls, flakes, pks ...... lb.	...	.08	...	.08	.07¼	.08
Balls, ref'd, bbls, wks .. lb.	...	.07¼	...	.07¼	.06¾	.07¼
Flakes, ref'd, bbls, wks .. lb.	...	.07¼	...	.07¼	.06¾	.07¼
Nickel Carbonate, bbls .... lb.	.36	.37½	.36	.37½	...	.36
Chloride, bbls .... lb.	.18	.20	.18	.20	.18	.19
Metal ingot .... lb.	...	.35	...	.35	...	.35
Oxide, 100 lb kgs, NY .. lb.	.35	.37	.35	.37	.35	.37
Salt, 400 lb bbls, NY ... lb.	.13	.13½	.13	.13½	.13	.13½
Single, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, 40%, drs, sulfate, 55 lb drs .... lb.	...	.76	...	.76	.75	1.17
Nitre Cake, blk .... ton	...	16.00	...	16.00	12.00	14.00
Nitrobenzene, redistilled, 1000 lb drs, wks .... lb.	.08	.10	.08	.10	.08	.11
tks .... lb.	...	.07⅓	...	.07½	...	.08⅓
Nitrocellulose, c-l-l c-l, wks lb.	.22	.29	.26	.29	.26	.34
Nitrogenous Mat'l, bgs, imp unit	...	3.35	3.35	3.55	2.00	3.10
dom, Eastern wks .... unit	...	3.40	3.60	4.25	1.90	3.00
dom, Western wks .... unit	...	3.15	3.15	3.75	1.85	2.75
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs ..... lb.	.20	.22	.20	.22	.16	.18
Chinese, bgs .... lb.	.20	.22	.20	.22	.19	.20
OAK BARK						
Oak Bark Extract, 25%, bbls lb.	...	.03⅛	...	.03⅛	...	.03½
tks .... lb.	...	.02¾	...	.02¾	...	.02¾
Octyl Acetate, tks, wks ... lb.	.16	.17	.16	.17	...	.15
Orange-Mineral, 1100 lb cks NY .... lb.	...	.11½	.11¼	.12¾	.10	.11¼
Orthoaminophenol, 50 lb kgs. lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs lb.	.70	.74	.70	.74	.82	.84
Orthochlorophenol, drs .... lb.	.35	.75	.35	.75	.50	.65
Orthocresol, drs, wks ..... lb.	.13½	.14½	.13½	.14½	.13	.15
Orthodichlorobenzene, 1000 lb drs .... lb.	.06	.07	.05	.07	.05	.11½

o Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila. or N. Y.

	Current Market		1937 Low	1937 High	1936 Low	1936 High
Orthonitrochlorobenzene, 1200 lb drs, wks ....lb.	.28	.29	.28	.29	.28	.29
Orthonitroparachlorphenol, tins ....lb.	.70	.75	.70	.75	.70	.75
Orthonitrophenol, 350 lb drs ....lb.	.85	.90	.85	.90	.52	.80
Orthonitrotoluene, 1000 lb drs, wks ....lb.	.07	.10	.07	.10	.07	.10
Orthotoluidine, 350 lb bbls, l-c-l ....lb.	.16	.17	.14	.17	.14	.15
Osage Orange, cryst, bbls ..lb.	.17	.25	.17	.25	.17	.25
51° liquid ....lb.	.07	.08	.07	.08	.07	.07¼
Paraffin, rfd, 200 lb cs slabs						
122-127° M P ....lb.	.0445	.04½	.0445	.04½	.0445	.04½
128-132° M P ....lb.	.04¾	.049	.04¾	.049	.04¾	.049
133-137° M P ....lb.	.05½	.05¾	.05½	.05¾	.05½	.05¾
Para aldehyde, 110-55 gal drs ....lb.	.16	.18	.16	.18	.16	.18
Aminoacetanilid, 100 lb kgs ....lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs ....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs ......lb.	.30	.45	.30	.45	.50	.65
Dichlorobenzene, 200 lb drs, wks ....lb.	.16	.18	.16	.20	.16	.20
Formaldehyde, drs, wks ..lb.	.34	.35	.34	.35	.34	.39
Nitroacetanilid, 300 lb bbls ....lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks ....lb.	.45	.47	.45	.47	.47	.51
Nitrochlorobenzene, 1200 lb drs, wks ....lb.	.23½	.24	.23½	.24	.23½	.24
Nitro-orthotoluidine, 300 lb bbls ....lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	.35	.37	.35	.37	.45	.50
Nitrosodimethylaniline, 120 lb bbls ....lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	...	.35	...	.35	.36	.37
Para Tertiary amyl phenol, wks, drs, c-l ....lb.	...	.26	...	.26	.26	.50
Phenylenedamine, 350 lb bbls ....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb bbls ....lb.	.70	.75	.70	.75	.70	.75
tks, wks ....lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks ....lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks ....lb.	.56	.58	.56	.58	.56	.60
Paris Green, dealer, drs, frt E. of Cleveland ....lb.	.22	.24	.22	.24	...	.24
Pentane, normal, 28-38° C, group 3, tks ....gal.	...	.08½	.08½	.09½	.09	.09½
drs, group 3 ....gal.	.14	.16	.12½	.16	.10	.16
Perchlorethylene, 100 lb drs, frt allowed ....lb.	...	.10½	...	.10½	.10½	.15
Petrolatum, dark amber, bbls ....lb.	.02⅞	.03	.02⅝	.03	.02⅝	.02⅞
Light, bbls ....lb.	.03⅛	.03⅜	.03⅛	.03⅜	.03⅛	.03⅜
Medium, bbls ....lb.	.02⅞	.03⅛	.02⅞	.03⅛	.02⅞	.03⅛
Dark green, bbls ....lb.	.02½	.02¾	.02½	.02¾	.02½	.02¾
Red, bbls ....lb.	.02⅝	.03¾	.02⅛	.03¾	.02⅛	.02⅝
White, lily, bbls ....lb.	.06	.06¼	.06	.06¼	.06	.06¼
White, snow, bbls ....lb.	.07	.07¼	.07	.07¼	.07	.07¼
Petroleum Ether, 30-60°, group, 3 tks ....gal.	...	.13	...	.13	...	.13
drs, group 3 ....gal.	.14	.17	.15	.17	.15	.16

PETROLEUM SOLVENTS AND DILUENTS

Cleaners naphthas, group 3, tks, wks ....gal.	.07⅜	.07⅞	.07⅜	.07⅞	.07⅜	.07½
Bayonne, tks, wks ..gal.	...	.10	.09½	.10	.09	.09½
West Coast, tks ....gal.	...	.15	...	.15	...	.15
Hydrogenated, naphthas, frt allowed East, tks ...gal.	...	.16	...	.16	.15	.16
No. 2, tks ....gal.	...	.18	...	.18	...	.18
No. 3, tks ....gal.	...	.16	...	.16	...	.15
No. 4, tks ....gal.	...	.18	...	.18	...	.18
Lacquer diluents, tks						
Bayonne ....gal.	.12	.12½	.12	.12½	.12	.12½
Group 3, tks ....gal.	.08⅜	.08⅞	.08⅜	.08⅞	.07⅞	.08½
Naphtha, V.M.P., East, tks, wks ....gal.	...	.11	.10	.11	.09	.10
Group 3, tks, wks ...gal.	.07⅜	.07⅞	.07⅜	.07⅞	.07⅜	.07½
Petroleum thinner, East, tks, wks ....gal.	...	.10	.09	.10	.09	.09½
Group 3, tks, wks ...gal.	.06⅜	.06⅞	.06⅜	.06⅞	.06⅜	.06⅝
Rubber Solvents, stand grd, East, tks, wks ......gal.	...	.10	.09½	.10	.09	.09½
Group 3, tks, wks ...gal.	.07⅜	.07⅞	.07⅜	.07⅞	.07⅜	.07½
Stoddard Solvent, East, tks, wks ....gal.	...	.10	.09½	.10	.09	.09½
Group 3, tks, wks ...gal.	.06⅞	.07⅜	.06⅞	.07⅜	.06⅞	.07
Phenol, 250-100 lb drs ....lb.	.13¼	.15	.13¼	.15	.13¼	.15
tks, wks ....lb.	...	.12¾	...	.12¾	...	...
Phenyl-Alpha-Naphthylamine, 100 lb kgs ....lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs .....lb.	...	.17	.16	.17	...	.16
Phenylhydrazine Hydrochloride, com ....lb.	2.30	6.50	2.30	6.50	2.90	3.00
Phloroglucinol, tech, tins ..lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tins ....lb.	20.00	22.00	20.00	22.00	20.00	22.00

	Current Market		1937 Low	1937 High	1936 Low	1936 High
Phosphate Rock, f.o.b. mines						
Florida Pebble, 68% basis ton	...	1.85	...	1.85	...	1.85
70% basis ....ton	...	2.35	...	2.35	...	2.35
72% basis ....ton	...	2.85	...	2.85	...	2.85
75-74% basis ....ton	...	3.85	...	3.85	...	3.85
75% basis ....ton	...	5.50	...	5.50	...	4.35
Tennessee, 72% basis..ton	...	4.50	...	4.50	...	4.50
Phosphorus Oxychloride 175 lb cyl ....lb.	.16	.20	.16	.20	.16	.20
Red, 110 lb cases ......lb.	.40	.44	.40	.44	.40	.45
Sesquisulfide, 100 lb cs..lb.	.38	.44	.38	.44	.38	.44
Trichloride, cyl ....lb.	.15	.18	.15	.20	.16	.20
Yellow, 110 lb cs, wks..lb.	.24	.30	.24	.33	.28	.33
Phthalic Anhydride, 100 lb drs, wks ....lb.	.14½	nom.	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls						
Destructive dist ....lb.	...	.65	.49	.65	.44	.50
Steam dist wat wh bbls gal.	...	.79	.64	.79	.64	.65
tks ....gal.	...	.74	.59	.74	...	.59
Pitch Hardwood, wks ....ton	18.25	18.75	15.00	18.75	...	15.00
Coaltar, bbls, wks .....ton	.	19.00	.	19.00	...	19.00
Burgundy, dom, bbls, wks lb.	.05½	.06½	.03½	.06½	...	.03½
Imported ....lb.	.11½	.12½	.11	.13	.11	.13
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls ....bbl.	6.00	6.50	6.00	6.50	4.00	5.25
Stearin, drs ....lb.	.03	.04½	.03	.04½	.03	.04½
Platinum, ref'd ....oz.	56.00	66.00	45.00	68.00	34.50	64.00

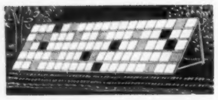
POTASH

	Current Market		1937 Low	1937 High	1936 Low	1936 High
Potash, Caustic, wks, sol..lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
flake ....lb.	.07	.07⅜	.07	.07⅜	.07	.07⅜
Liquid, tks ....lb.	...	.02⅞	...	.02⅞	...	.02⅞
Manure Salts, imported 30% basis, blk .....unit	...	.58½	.55	.58½	...	...
Potassium Abietate, bbls ..lb.	...	.13	...	...	...	...
Acetate ....lb.	.26	.28	.26	.28	.26	.28
Bicarbonate, USP, 320 lb bbls ....lb.	.09	.18	.09	.18	.09	.18
Bichromate Crystals, 725 lb cks* ....lb.	.08½	.09	.08½	.09	.08½	.09
Binoxalate, 300 lb bbls..lb.	...	.23	...	.23	...	.23
Bisulfate, 100 lb kgs ...lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800 lb cks ....lb.	.06½	.07	.06½	.07	.06½	.07½
liquid, tks ....lb.	...	.02¾	...	.02¾	.02¾	.02⅞
drs, wks ....lb.	.02⅞	.03½	.02⅞	.03½	.02⅞	.03¼
Chlorate crys, 112 lb kgs, wks ....lb.	.09¼	.09½	.09¼	.09½	.09¼	.09½
gran, kgs ....lb.	.12	.13	.12	.13	.12	.13
powd, kgs ....lb.	.08½	.08¾	.08½	.08¾	.08	.08¼
Chloride, crys, bbls ....lb.	.04	.04¾	.04	.04¾	.04	.04¾
Chromate, kgs ....lb.	.28	.29	.28	.29	.23	.28
Cyanide, 110 lb cases ..lb.	.55	.57½	.55	.57½	.55	.57½
Iodide, 75 lb bbls ......lb.	.93	1.00	.93	1.15	1.10	1.25
Metabisulfite, 300 lb bbls lb.	.11	.12	.11	.15	.13¾	.15
Muriate, bgs, dom, blk unit	...	.53½	.50	.53½	.45	.50
Oxalate, bbls ....lb.	.25	.26	.25	.26	.25	.26
Perchlorate, kgs, wks ...lb.	.09	.11	.09	.11	.09	.11
Permanganate, USP, crys, 500 & 1000 lb drs, wks lb.	.18½	.19½	.18½	.19½	.18½	.19½
Prussiate, red, bbls .....lb.	.35	.37	.35	.37	.35	.38½
Yellow, bbls ....lb.	.15	.16	.15	.18	.16	.19
Sulfate, 90% basis, bgs ton	...	36.25	...	36.25	33.75	36.25
Titanium Oxalate, 200 lb bbls ....lb.	.33	.35	.33	.35	.32	.35
Pot & Mag Sulfate, 48% basis bgs ....ton	...	25.75	24.75	25.75	22.25	24.75
Propane, group 3, tks ....lb.	.03	.04⅜	.03	.04⅜	.03	.04⅜
Putty, coml, tubs .....100 lb.	...	2.90	2.90	3.00	2.75	3.00
Linseed Oil, kgs ...100 lb.	...	4.65	4.65	4.75	4.50	4.75
Pyrethrum, conc liq:						
2.4% pyretherins, drs, frt allowed ....gal.	5.00	5.25	4.15	5.25	...	...
3.6% pyretherins, drs, frt allowed ....gal.	7.75	7.85	6.10	7.85	...	...
Flowers, coarse, Japan, bgs ....lb.	...	.14¾	.12¾	.14¾	...	...
Fine powd, bbls ......lb.	...	.17¾	.14	.17¾	...	...
Pyridine, denat, 50 gal drs gal.	...	1.55	1.30	1.55	...	1.30
Pyrites, Spanish cif Atlantic ports, blk ....unit	.12	.13	.12	.13	.12	.13
Pyrocatechin, CP, drs, tins lb.	2.15	2.75	2.15	2.75	2.15	2.75
Quebracho, 35% liq tks ...lb.	...	.03	.02⅞	.03	.02⅝	.02⅞
450 lb bbls, c-l ....lb.	...	.03½	.03½	.03⅞	.03⅝	.03⅞
Solid, 63%, 100 lb bales cif ....lb.	...	.04	.03⅞	.04	.03⅝	.03⅞
Clarified, 64%, bales..lb.	...	.04¼	.04¼	.04⅜	.03⅞	.04⅜
Quercitron, 51 deg liq, 450 lb bbls ....lb.	.06	.06½	.06	.06½	.06	.06½
Solid, drs ....lb.	.10	.12	.10	.12	.10	.12

R SALT

	Current Market		1937 Low	1937 High	1936 Low	1936 High
R Salt, 250 lb bbls, wks ..lb.	.52	.55	.52	.55	.52	.57
Resorcinol tech, cans .....lb.	.75	.80	.75	.80	.75	.80
Rochelle Salt, cryst ......lb.	.16	.16½	.14½	.16½	.14	.15
Powd, bbls ....lb.	.15	.15½	.13½	.15½	.13	.14
Rosin Oil, bbls, first run gal.	.58	.60	.58	.73	.38	.71
Second run ....gal.	.60	.62	.60	.75	.43	.73
Third run, drs ....gal.	.64	.66	.64	.79	.49	.77

* Spot price is ⅛c higher.



	Current Market		1937 Low	1937 High	1936 Low	1936 High
Rosins 600 lb bbls, 280 lb unit ex. yard NY:						
B	...	9.05	8.30	10.00	4.45	10.95
D	...	9.05	8.35	10.35	4.95	10.95
E	...	9.05	8.80	10.25	5.15	10.95
F	...	9.05	9.05	10.80	5.40	10.95
G	...	9.05	9.05	10.85	5.50	10.95
H	...	9.05	9.05	10.85	5.60	10.95
I	...	9.05	9.05	10.90	5.70	10.95
K	...	9.05	9.05	10.90	5.55	10.95
M	...	9.05	9.05	11.00	5.60	10.95
N	...	9.10	9.10	11.05	5.70	11.00
WG	...	9.15	9.15	11.75	5.85	11.00
WW	...	9.85	9.85	13.75	5.90	12.05
Rosins, Gum, Savannah (280 lb unit):						
B	...	7.80	7.05	8.75	3.15	9.70
D	...	7.80	7.10	9.00	3.75	9.70
E	...	7.80	7.55	9.10	3.90	9.70
F	...	7.80	7.80	9.55	4.10	9.70
G	...	7.80	7.80	9.60	4.20	9.70
H	...	7.80	7.80	9.60	4.30	9.70
I	...	7.80	7.80	9.65	4.35	9.70
K	...	7.80	7.80	9.65	4.30	9.70
M	...	7.80	7.80	9.75	4.35	9.70
N	...	7.85	7.85	9.75	4.45	9.75
WG	...	7.90	7.90	10.50	4.45	9.75
WW	...	8.60	8.60	12.50	4.55	10.80
X	...	8.70	8.70	12.50	4.55	10.80
Rosin, Wood, c-l, FF grade, NY	8.56	9.65	8.56	10.72	6.10	10.52
Rotten Stone, bgs mines . . ton	...	35.00	...	35.00	.	35.00
Imported, lump, bbls . . . lb.	...	.12	...	...	...	...
Powdered, bbls . . . . lb.	.08½	.10	...	...	...	...

SAGO FLOUR

	Current Market		1937 Low	1937 High	1936 Low	1936 High
Sago Flour, 150 lb bgs . . . lb.	.03¼	.03¾	.02¾	.03¾	.02¾	.03¾
Sal Soda, bbls, wks . . . 100 lb.	...	1.15	...	1.15	1.15	1.30
Salt Cake, 94-96%, c-l, wks ton	19.00	23.00	19.00	23.00	19.00	23.00
Chrome, c-l, wks . . . . . . ton	11.00	12.00	11.00	12.00	11.00	13.00
Saltpetre, gran, 450-500 lb bbls . . . . . lb.	.06	.064	.06	.064	.059	.06¼
Cryst, bbls . . . . lb.	.07	.074	.07	.074	.069	.08
Powd, bbls . . . . lb.	.07	.074	.07	.074	.069	.07⅞
Satin, White, 550 lb bbls . . lb.	...	.01½	...	.01½	...	.01½
Schaeffer's Salt, kgs . . . . . lb.	.46	.48	.46	.48	.46	.50
Shellac, Bone dry, bbls . . lb. r	.17½	.18	.17½	.22	.17½	.26½
Garnet, bgs . . . . lb.	.15	.16	.15	.17	.16	.20
Superfine, bgs . . . . . . lb. s	.13½	.14	.13½	.18½	.14½	.18½
T. N., bgs . . . . lb. s	.12½	.13	.12½	.14½	.13½	.16
Silver Nitrate, vials . . . . . oz.	.32⅞	.34⅞	.32⅝	.35½	.32 1/16	.34⅞
Slate Flour, bgs, wks . . . . ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks . . . . 100 lb.	...	1.25	...	1.25	...	1.25
58% light, bgs . . . . . 100 lb.	...	1.23	...	1.23	...	1.23
blk . . . . 100 lb.	...	1.05	...	1.05	...	1.05
paper bgs . . . . 100 lb.	...	1.20	...	1.20	...	1.20
bbls . . . . 100 lb.	...	1.50	...	1.50	...	1.50
Caustic, 76% grnd & flake, drs . . . . 100 lb.	...	3.00	...	3.00	...	3.00
76% solid, drs . . . . . 100 lb.	...	2.60	...	2.60	...	2.60
Liquid sellers, tks . . 100 lb.	...	2.25	...	2.25	...	2.25
Sodium Abietate, drs . . . . . lb.	...	.13	.08	.13	...	.08
Acetate, tech, 450 lb bbls, wks . . . . lb.	.04¼	.05	.04¼	.05	.04½	.05
Alignate, drs . . . . lb.	...	.69	.64	.69	.	.64
Antimoniate, bbls . . . . . . lb.	.14¾	.15¼	.13¾	.16¼	.12	.14
Arsenate, drs . . . . lb.	.08	.08½	.08	.11½	...	.10½
Arsenite, liq, drs . . . . . gal.	.30	.33	.33	.40	.40	.75
Benzoate, USP, kgs . . . . lb.	.46	.48	.46	.48	.46	.48
Bicarb, 400 lb bbl, wks 100 lb.	...	1.75	...	1.75	1.75	1.85
Bichromate, 500 lb cks, wks* . . . . lb.	.06½	.07	.06½	.07	.06½	.07
Bisulfite, 500 lb bbl, wks lb.	.03¼	.036	.03¼	.036	.03¼	.036
35-40% sol bbls, wks 100 lb.	1.40	1.80	...	...	...	...
Chlorate, bgs, wks . . . . . lb.	.06¼	.07½	.06¼	.07½	.06¼	.07½
Cyanide, 96-98%, 100 & 250 lb drs, wks . . . . . . lb.	.16½	.17½	.15½	.17½	.15½	.17½
Fluoride, 90%, 300 lb bbls, wks . . . . lb.	.07½	.08¼	.07½	.08¼	.07¼	.08¼
Hydrosulfite, 200 lb bbls, f.o.b. wks . . . . lb.	.16	.17	.16	.17	.17	.19
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.	2.50	3.00	2.50	3.00	2.50	3.00
Tech, reg cryst, 375 lb bbls, wks . . . . . . 100 lb.	2.40	2.75	2.40	2.75	2.40	2.75
Iodide . . . . lb.	1.90	1.95	1.90	1.95	1.90	2.05
Metal, drs, 280 lbs . . . . . lb.	...	.19	...	.19	...	...
Metanilate, 150 lb bbls . . lb.	.41	.42	.41	.42	.41	.42
Metasilicate, gran, c-l, wks . . . . 100 lb.	...	2.15	...	2.15	2.15	3.00
cryst, bbls, c-l, wks 100 lb.	...	2.75	...	2.75	2.75	3.25
Monohydrate, bbls . . . . . lb.	..	.023	...	.023	...	.023
Naphthenate, drs . . . . . . lb.	.12	.19	.09	.19	. .	.09
Naphthionate, 300 lb bbl lb.	.52	.54	.52	.54	.52	.54
Nitrate, 92%, crude, 200 lb bgs, c-l, NY . . . . ton	...	28.30	26.80	28.30	24.80	26.80
100 lb bgs . . . . ton	...	29.00	27.50	29.00	25.50	27.50
Bulk . . . . ton	...	27.00	25.50	27.00	23.50	25.50

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 3c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case; s T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. * Spot price is ½c higher.

	Current Market		1937 Low	1937 High	1936 Low	1936 High
Sodium (continued):						
Nitrite, 500 lb bbls ..... lb.	.07	.10	.07	.10	.07	.08
Orthochlorotoluene, sulfonate, 175 lb bbls, wks .. lb.	.25	.27	.25	.27	.25	.27
Perborate, drs, 400 lbs .. lb.	.14¾	.15¼	.14¾	.15¼	.14¾	.18
Peroxide, bbls, 400 lb ... lb.	...	.17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	...	1.90	...	1.90	1.95	2.30
bgs, wks .... 100 lb.	...	1.70	...	1.70	1.75	2.10
Tri-sodium, tech, 325 lb bbls, wks .... 100 lb.	...	2.05	...	2.05	1.95	2.30
bgs, wks .... 100 lb.	...	1.85	...	1.85	1.75	2.10
Picramate, 160 lb kgs ... lb.	.65	.67	.65	.67	.65	.69
Prussiate, Yellow, 350 lb bbl, wks .... lb.	.10	.11½	.10	.11½	.10	.12
Pyrophosphate, anhyd, 100 lb bbls .... lb.	...	.10	...	.10	.10	.132
Sesquisilicate, drs, c-l, wks .... 100 lbs.	...	3.00	...	...	...	...
Silicate, 60°, 55 gal drs, wks .... 100 lb.	1.65	1.70	1.65	1.70	1.65	1.70
40°, 35 gal drs, wks 100 lb.	...	.80	...	.80	...	.80
tks, wks .... 100 lb.	...	.65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY .... lb.	.05¾	.06½	.05¾	.07	.05¼	.07¼
Stannate, 100 lb drs .... lb.	.37½	.40½	.33	.44	.28½	.37½
Stearate, bbls .... lb.	...	.24	.19	.24	.20	.26
Sulfanilate, 400 lb bbls .. lb.	.16	.18	.16	.18	.16	.18
Sulfate Anhyd, 550 lb bgs* c-l, wks .... 100 lb. ‡	1.45	1.90	1.45	1.90	1.30	1.90
Sulfide, 80% cryst, 440 lb bbls, wks .... lb.	...	.02¼	...	.02¼	...	.02¼
62% solid, 650 lb drs, c-l, wks .... lb.	...	.02	...	.02	...	.03
Sulfite, cryst, 400 lb bbls, wks .... lb.	.023	.02½	.023	.02½	.023	.02½
Sulfocyanide, drs ...... lb.	.28	.47	.28	.47	.28	.47
Sulforicinoleate, bbls ... lb.	...	.12	...	.12	...	...
Tungstate, tech, crys, kgs lb.	...	nom.	.85	.90	.85	.90
Sorbitol, com., drs, basis content, wks .... lb.	...	.25	...	.25	...	...
Spruce Extract, ord, tks ... lb.	...	.01	...	.01	...	.01
Ordinary, bbls .... lb.	...	.01½	...	.01½	...	.01½
Super spruce ext, tks ... lb.	...	.01⅝	...	.01⅝	...	.01⅝
Super spruce ext, bbls .. lb.	...	.01⅞	...	.01⅞	...	.01⅞
Super spruce ext, powd, bgs .... lb.	...	.04¼	.04	.04¼	...	.04
Starch, Pearl, 140 lb bgs 100 lb.	3.78	3.98	3.78	4.53	2.99	4.30
Powd, 140 lb bgs ... 100 lb.	3.88	4.08	3.88	4.63	3.90	4.54
Potato, 200 lb bgs ..... lb.	...	.05½	.04½	.05½	.04½	.05½
Imp, bgs .... lb.	.05½	.06	.05	.06	.05	.06
Rice, 200 lb bbls ...... lb.	...	.07¼	...	.07¼		.07¼
Wheat, thick, bgs .. lb.	.07	.08½	.07	.08½	.08¼	.08½
Strontium carbonate, 600 lb bbls, wks .... lb.	.07¼	.07½	.07¼	.07½	.07¼	.07½
Nitrate, 600 lb bbls, NY lb.	.07¾	.08¾	.07¾	.08¾	.08¾	.09½
Sucrose octa-acetate, den, grd, bbls, wks .... lb.	.45	...	.45	...	.45	...
tech, bbls, wks .... lb.	.40	...	.40	...	.40	...
Sulfur, crude, f.o.b. mines. ton	18.00	19.00	18.00	19.00	18.00	19.00
Flour, coml, bgs .... 100 lb.	1.65	2.35	1.65	2.35	1.60	2.35
bbls .... 100 lb.	1.95	2.70	1.95	2.70	1.95	2.70
Rubbermakers, bgs .. 100 lb.	2.20	2.80	2.20	2.80	2.20	2.80
bbls .... 100 lb.	2.55	3.15	2.55	3.15	2.55	3.15
Extra fine, bgs ..... 100 lb.	2.85	3.00	2.85	3.00	2.40	3.00
Superfine, bgs ...... 100 lb.	2.65	2.80	2.65	2.80	2.20	2.80
bbls .... 100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs .... 100 lb.	3.00	3.75	3.00	3.75	3.00	3.75
bbls .... 100 lb.	3.35	4.10	3.35	4.10	3.35	4.10
Roll, bgs .... 100 lb.	2.35	3.10	2.35	3.10	2.35	3.10
bbls .... 100 lb.	2.50	3.25	2.50	3.25	2.50	3.25
Sulfur Chloride, 700 lb drs, wks .... lb.	.03	.04	.02½	.04	...	...
Sulfur Dioxide, 150 lb cyl lb.	.07	.09	.07	.09	.06½	.08½
Multiple units, wks .... lb.	.04½	.07	.04½	.07	.05½	.06
tks, wks .... lb.	.04	.05	.04	.05	.04½	.04¾
Refrigeration, cyl, wks .. lb.	.16	.17	.15	.17	.10	.13
Multiple units, wks .... lb.	.07½	.10	.07½	.10	.07	.09¼
Sulfuryl Chloride .... lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd ..... ton	...	58.50	58.50	65.00	52.00	60.00
Extract, 42°, bbls ...... lb.	.05¼	.06¼	.05¼	.06¼	...	...
Superphosphate, 16% bulk, wks .... ton	...	8.50	8.25	8.50	...	...
Run of pile .... ton	...	8.00	...	8.00	...	...
Triple, 44-45%, a. p. a. bulk, wks, Balt. unit ... ton	...	.70	...	.70	...	...
Talc, Crude, 100 lb bgs, NY ton	13.00	15.00	13.00	15.00	13.00	15.00
Ref'd, 100 lb bgs, NY ton	14.00	16.00	14.00	16.00	14.00	18.00
French, 220 lb bgs, NY ton	23.00	30.00	23.00	30.00	22.00	30.00
Ref'd, white, bgs, NY ton	45.00	60.00	45.00	60.00	45.00	60.00
Italian, 220 lb bgs to arr ton	60.00	62.00	60.00	62.00	60.00	75.00
Ref'd, white, bgs, NY ton	65.00	70.00	65.00	70.00	65.00	80.00
Tankage Grd, NY ..... unit ‖	...	3.60	3.50	4.40	2.65	4.25
Ungrd .... unit ‖	...	3.60	3.50	4.35	2.40	4.25
Fert grade, f.o.b. Chgo unit ‖	...	3.25	3.25	4.00	2.40	4.00
South American cif unit ‖	...	3.70	3.80	4.25	2.70	3.90
Tapioca Flour, high grade, bgs .... lb.	.03¼	.05½	.03¼	.05½	.03½	.05½
Tar Acid Oil, 15%, drs .. gal.	.22½	.25½	.21	.25½	.21	.24
25%, drs .... gal.	.26½	.29½	.24½	.29½	.24	.27½
Tar, pine, delv, drs ..... gal.	...	.26	...	.26	.25	.26
tks, delv, E. cities .... gal.	...	.20	...	.20	...	.20
Tartar Emetic, tech, bbls .. lb.	.26¾	.27	.24¾	.27	.24¾	.25
USP, bbls .... lb.	.32	.32½	.30	.32½	.28	.30½
Terpineol, den grd, drs ... lb.	.13¾	.14¾	.13¾	.14¾	.13¾	.14¾
tks .... lb.	.13	.14	.13	.14	.13	.14

‡ Bags 15c lower; ‖ + 10; * Bbls. are 20c higher.

	Current Market		1937 Low	1937 High	1936 Low	1936 High
Tetrachlorethane, 650 lb drs lb.	.08	.08½	.08	.08½	.08	.08½
Tetrachloroethylene, drs, tech lb.	...	.10½	...	.10½	...	...
Tetralene, 50 gal drs, wks lb.	.12	.13	.12	.13	.12	.13
Thiocarbanilid, 170 lb bbl lb.	.20	.25	.20	.25	.20	.25
Tin, crystals, 500 lb bbls, wks lb.	.41½	.42	.37½	.46	.35	.39½
Metal, NY lb.	...	.58½	.49⅞	.66	.40½	.52½
Oxide, 300 lb bbls, wks lb.	.58	.60	.55	.59	.47	.57
Tetrachloride, 100 lb drs, wks lb.	...	.29½	.25½	.32	.21¼	.26¾
Titanium Dioxide, 300 lb bbls lb.	.16¼	.17	.16¼	.17	.16¼	.19¼
Barium Pigment, bbls lb.	.06⅛	.06⅜	.06	.06⅜	.05¾	.06½
Calcium Pigment, bbls lb.	.06⅛	.06⅜	.06	.06⅜	.05¾	.06½
Toluidine, mixed, 900 lb drs, wks lb.	.26	.27	.26	.27	.27	.28
Toluol, 110 gal drs, wks gal.	...	.35	...	.35	...	.35
8000 gal tks, frt allowed gal.	...	.30	.	.30	..	.30
Toner Lithol, red, bbls lb.	.75	.80	.75	.80	.75	.80
Para, red, bbls lb.	...	.75	...	.75	. .	.75
Toluidine, bgs lb.	...	1.35	...	1.35	...	1.35
Triacetin, 50 gal drs, wks lb.	...	.36	...	.36	.32	.36
Triamyl Borate, lcl, drs, wks lb.	...	.27	..	.27	...	...
Triamylamine, c-l, drs, wks lb.	.77	1.25	.77	1.25	...	1.25
Tributyl citrate, drs, frt all'd lb.	...	.45	...	.45	...	...
Tributyl Phosphate, frt all'd lb.	...	.50	...	.50	...	...
Trichlorethylene, 600 lb drs, frt allowed E. Rocky Mts lb.	.089	.094	.089	.094	.089	.094
Tricresyl phosphate, tech, drs lb.	...	.26½	.22½	.26½	.19	.26
Triethanolamine, 50 gal drs wks lb.	.21	.22	.21	.30	.26	.30
tks, wks lb.	...	.20	.20	.25	...	.25
Triethylene glycol, drs, wks lb.	...	.26	...	...	...	.
Trihydroxyethylamine Oleate, bbls lb.	...	.30	...	...	...	...
Stearate, bbls lb.	...	.30	...	...	...	...
Trimethylamine, c-l, drs, frt allowed E. Mississippi lb.	.	1.00	...	1.00	..	...
Triphenylguanidine lb.	.58	.60	.58	.60	.58	.60
Triphenyl Phosphate, drs lb.	.34	.36	.	...	.	. .
Tripoli, airfloated, bgs, wks ton	25.00	30.00	25.00	30.00	27.50	30.00
Turpentine (Spirits), c-l, NY dock, bbls gal.	...	.38	.38	.47	.40½	.50
Savannah, bbls gal.	...	.33	.33	.42	.35½	.45
Jacksonville, bbls gal.	...	.33	.33	.41	.35¼	.44½
Wood Steam dist, bbls, c-l, NY gal.	.37	.40	.36	.44	.38	.47
Urea, pure, 112 lb cases lb.	.14½	.15½	.14½	.15½	.14½	.17
Fert grade, bgs, c.i.f. ton c.i.f. S.A. points ton	95.00	110.00	95.00	110.00	95.00	110.00
Dom, f.o.b., wks ton	95.00	101.00	95.00	101.00	95.00	110.00
Urea Ammonia liq 55% NH_3, tks unit	No prices		1.00	1.04	...	.96
Valonia beard, 42%, tannin bgs ton	...	46.00	35.00	49.00	46.00	64.50
Cups, 32% tannin, bgs ton	...	33.50	31.50	36.00	34.00	42.00
Vanilin, ex eugenol, 25 lb tins, 2000 lb lots lb.	...	3.65	...	3.65	3.65	3.75
Ex-guaiacol lb.	...	3.55	.	3.55	3.55	3.65
Vermillion, English, kgs lb.	...	1.75	1.72	1.90	1.52	1.85
Wattle Bark, bgs ton	41.75	43.75	31.00	43.75	26.50	32.00
Extract, 60°, tks, bbls lb.	...	.04⅝	.03⅝	.04⅝	...	.03⅝
WAXES						
Wax, Bayberry, bgs lb.	.17	.17½	.16½	.17½	.16½	.20
Bees, bleached, white 500 lb slabs, cases lb.	.39	.45	.38	.45	.34	.40
Yellow, African, bgs lb.	.27½	.28	.27½	.30	.24	.27
Brazilian, bgs lb.	.32	.34	.33	.34	.25	.29½
Chilean, bgs lb.	.32	.34	.30	.34	.25	.29½
Refined, 500 lb slabs, cases lb.	.35	.39	.29½	.39	.28	.32
Candelilla, bgs lb.	.14	.15	.14	.16½	.14	.17½
Carnauba, No. 1, yellow, bgs lb.	.47	.48½	.45	.49	.43½	.48
No. 2, yellow, bgs lb.	.45½	.46	.43½	.46½	.42	.46
No. 2, N. C., bgs lb.	.41¾	.42	.38	.43	.38	.40
No. 3, Chalky, bgs lb.	.38¾	.39¾	.34½	.39¾	.33½	.38
No. 3, N. C., bgs lb.	.38¾	.43	.35	.43	.34	.41
Ceresin, dom, bgs lb.	.08½	.12	.08	.12	.08	.11
Japan, 224 lb cases lb.	.09½	.10	.09½	.11	.08	.10½
Montan, crude, bgs lb.	.11	.12	.11	.12	.10¾	.11¾
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.23	.24	.23	.24	.22	.24
Cakes, cases lb.	.24	.25	.24	.25	.23	.25
Whiting, chalk, com, 200 lb bgs c-l, wks ton	12.00	14.00	12.00	14.00	...	15.00
Gilders, bgs, c-l, wks ton	...	15.00	...	15.00	11.50	15.00
Wood Flour, c-l, bgs ton	20.00	30.00	18.00	30.00	18.00	30.00
Xylol, frt allowed, East 10° tks, wks gal.	...	.33	...	.33	...	.33
Coml, tks, wks, frt all'd gal.	...	.30	...	.30	...	.30
Xylidine, mixed crude, drs lb.	.35	.36	.35	.36	.36	.37
Zinc, Carbonate tech, bbls, NY lb.	.14	.15	.12	.15	.09	.11
Chloride fused, 600 lb drs, wks lb.	.04½	.046	.04½	.046	.04½	.05¾
Gran, 500 lb drs, wks lb.	.05	.05¾	.05	.05¾	.05	.05¾
Soln 50%, tks, wks 100 lb.	...	2.25	2.00	2.25	...	2.00
Cyanide, 100 lb drs lb.	.36	.38	.36	.38	.36	.38
Zinc Dust, 500 lb bbls, c-l, delv lb.	...	.089	.079	.094	.068	.0755
Metal, high grade slabs, c-l, NY 100 lb.	...	7.35	6.35	7.85	...	5.825
E. St. Louis 100 lb.	...	7.00	6.00	7.50	4.80	5.45
Oxide, Amer, bgs, wks lb.	.06¼	.06½	.05¼	.06½	.05	.05½
French, 300 lb bbls, wks lb.	.06¼	.07½	.05½	.07½	.05½	.07
Palmitate, bbls lb.	.23	.25	.23	.25	.22	.23
Resinate, fused, pale, bbls lb.	...	.10	.09	.10	.05¾	.10
Stearate, 50 lb bbls lb.	.20	.23	.20	.23	.19	.23

	Current Market		1937 Low	1937 High	1936 Low	1936 High
Zinc Sulfate, crys, 400 lb bbl,						
wks ....lb.	...	.033	.028	.033	.028	.033
Flake, bbls ....lb.	...	.0375	.032	.0375	.032	.035
Sulfide, 500 lb bbls, delv lb.	.09¼	.09¾	.09¼	.09¾	.09¼	.11¾
bgs, delv ....lb.	.09	.09½	.09	.09½	.09	.11½
Sulfocarbolate, 100 lb kgs						
..........lb.	.24	.26	.24	.26	.24	.25
Zirconium Oxide, crude, 73-75%						
grd, bbls, wks ....ton	75.00	100.00	...	...	...	...
kgs, wks ....lb.	.04¼	.04½	...	...	...	...

Oils and Fats

	Current Market		1937 Low	1937 High	1936 Low	1936 High
Babassu, tks, futures ....lb.	.08¼	.08½	.08¼	.11¼	...	...
Castor, No. 3, 400 lb bbls ....lb.	.10¼	.10¾	.10¼	.10¾	.10¼	.10¾
Blown, 400 lb bbls ....lb.	.12¼	.13	.12¼	.13	.12¼	.13
China Wood, drs, spot NY lb.	.12¾	.13	.12½	.14¾	.13	.19¼
Tks, spot NY ....lb.	.118	.12	.118	.148	.125	.19
Coast, tks ....lb.	...	nom.	.133	.146	.127	.18
Coconut, edible, bbls NY ..lb.	...	.11	.11	.15	.09¼	.14¼
Manila, tks, NY ....lb.	...	.05¼	.05¼	.09½	.04⅛	.07
Tks, Pacific Coast ....lb.	...	.05	.05	.08⅞	.03⅞	.08½
Cod, Newfoundland, 50 gal						
bbls ....gal.	.52	nom.	.51	.52	.40	.48½
Copra, bgs, NY ....lb.	.031	nom.	.031	.055	.0320	.0535
Corn, crude, tks, mills ....lb.	...	.08⅜	.08¼	.10¾	.08	.10½
Refd, 375 lb bbls, NY ..lb.	.11	.11¼	.11	.13¼	.10¾	.13
Degras, American, 50 gal bbls.						
NY ....lb.	...	.08¼	.07¾	.08¼	.05¼	.08
English, bbls, NY ....lb.	...	.08¼	.07¾	.08¼	.04	.08
Greases, Yellow ....lb.	.08⅛	.08¼	.07⅞	.09	.03⅜	.08¼
White, choice bbls, NY ..lb.	.08½	.09¾	.08¼	.10¼	.04⅛	.08¾
Herring, Coast, tks ....gal.	...	nom.	...	nom.	...	.31
Lard Oil, edible, prime ..lb.	...	.15½	.14¾	.16¾	.12¾	.16¼
Extra, bbls ....lb.	...	.13¼	.13	.13½	.09½	.13
Extra, No. 1, bbls ....lb.	...	.12½	.12½	.13½	.07¾	.12¼
Linseed, Raw less than 5 bbl						
lots ....lb.	...	.12	.107	.121	.104	.117
bbls, c-l, spot ....lb.	...	.112	.099	.113	.096	.103
Tks ....lb.	...	.106	.093	.107	.086	.097
Menhaden, tks, Baltimore gal.	...	.40	.37	.45	.25	.36
Refined, alkali, drs ....lb.	...	.089	.089	.10	.066	.084
Tks ....lb.	...	.083	.083	.09	.062	.078
Kettle bodied, drs ....lb.	...	.099	.099	.11	.08	.096
Light pressed, drs ....lb.	...	.083	.083	.094	.06	.078
Tks ....lb.	...	.076	.076	.084	.056	.072
Neatsfoot, CT, 20°, bbls, NY						
..........lb.	...	.18¼	.17½	.18¼	.16	.17
Extra, bbls, NY ....lb.	...	.12¾	.12¾	.13¾	.08	.12½
Pure, bbls, NY ....lb.	...	.13½	.13½	.14¼	.11½	.12¾
Oiticica, bbls ....lb.	.10⅞	.11	.10⅞	.12	.10	.15½
Oleo, No. 1, bbls, NY ....lb.	...	.13	.12⅜	.14½	.09¼	.14
No. 2, bbls, NY ....lb.	...	.12½	.11⅞	.14	.08¾	.13½
Olive, denat, bbls, NY ..gal.	1.50	nom.	1.50	1.65	.73	1.60
Edible, bbls, NY ....gal.	2.40	nom.	2.20	2.50	1.60	2.25
Foots, bbls, NY ....lb.	.11¼	nom.	.11¼	.12½	.08	.10⅜
Palm, Kernel, bulk ....lb.	.05½	.05¾	.05½	.08⅛	.04¾	.083
Niger, cks ....lb.	...	.05¾	.05⅝	.07¼	.04	.06½
Sumatra, tks ....lb.	...	.05	.05	.06½	.03¾	.06½
Peanut, crude, bbls, NY ..lb.	.08½	nom.	.08½	.10⅝	.08	.10½
Tks, f.o.b. mill ....lb.	.08¼	nom.	.08¼	.10¼	.17¾	.10⅜
Refined, bbls, NY ....lb.	.12¼	nom.	.12¼	.13½	.12	.13¼
Perilla, drs, NY ....lb.	.11¾	.12	.11	.12	.07	.11¾
Tks, Coast ....lb.	.112	.113	.105	.11½	.066	.11¼
Pine, see Pine Oil, Chemical Section.						
Rapeseed, blown, bbls, NY lb.	.14	.14¼	.13	.14¼	.086	.13½
Denatured, drs, NY ..gal.	.96	.97	.85	.97	.52	.85
Red, Distilled, bbls ....lb.	.11⅝	.12⅝	.11⅝	.12⅝	.08⅝	.11⅝
Tks ....lb.	...	.10¾	...	.10¾	.07¾	.09¼
Salmon, Coast, 8000 gal tks						
..........gal.	...	nom.	...	nom.	.31	.32½
Sardine, Pac Coast, tks ..gal.	...	.43½	.43½	.55	.28	.47
Refined alkali, drs ....lb.	...	.089	.089	.10	.066	.084
Tks ....lb.	...	.083	.083	.09	.062	.078
Light pressed, drs ....lb.	...	.083	.083	.094	.06	.078
Tks ....lb.	...	.076	.076	.084	.056	.072
Sesame, yellow, dom ....lb.	.11½	nom.	.11½	.13¼	.12¾	.14½
White, dos ....lb.	.11½	nom.	.11½	.13¼	.12¾	.14½
Soy Bean, crude						
Dom, tks, f.o.b. mills ..lb.	.09½	nom.	.09½	.10½	.07	.10½
Crude, drs, NY ....lb.	.101	.105	.101	.11½	.076	.11½
Ref'd, drs, NY ....lb.	.111	.11½	.111	.12½	.081	.12½
Tks ....lb.	.10½	.109	.10½	.11½	.07½	.11½
Sperm, 38° CT, bleached, bbls						
NY ....lb.	.096	.098	.096	.102	.094	.102
45° CT, bleached, bbls,						
NY ....lb.	.089	.091	.089	.095	.087	.095
Stearic Acid, double pressed						
dist bgs ....lb.	.12½	.13½	.12½	.13½	.08½	.12½
Double pressed saponified						
bgs ....lb.	.12¾	.13¾	.12¾	.13¾	.09	.12¾
Triple pressed dist bgs ..lb.	.15½	.16½	.15½	.16½	.11¼	.15½
Stearine, Oleo, bbls ....lb.	.09¾	.09⅞	.09	.11½	.07¼	.12¼
Tallow City, extra loose ..lb.	...	.08⅛	.08⅛	.09¼	.04⅛	.08⅜
Edible, tierces ....lb.	...	.08¾	.08½	.10¼	.06¾	.09½
Acidless, tks, NY ....lb.	...	.12	.12	.13	.07	.11¾
Turkey Red, single, bbls ..lb.	.08	.08½	.08	.08½	.08	.08½
Double, bbls ....lb.	.12½	.13	.12½	.13	.12½	.13½
Whale:						
Winter bleach, bbls, NY lb.	.105	.107	.091	.111	.072	.087
Refined, net, bbls, NY ..lb.	.101	.103	.087	.107	.068	.083

Index to Advertisers

"We"—Editorially Speaking

The news release by Bob Quinn, publicity agent of the Chemist's Club Golf Tournament, contains the following "natural": "Doc R. E. Dorland with a snappy score of 114—30—74 won second low net prize, a lovely chemical engineer handbook donated by Sid Kirkpatrick." If that arithmetic is correct, the only thing that Doc can do about it is to return the compliment by sending Sid a 500 lb. drum of Epsom salts.

Orchids to N. R. Crawford, Dowell's manager at Tulsa, for his completely good-natured, and utterly devastating letter to *Time* correcting their free-and-easy yarn about the new industry of acidizing oil and gas wells. Incidentally, a lot of chemical people will be a bit surprised to learn that this business grosses $5,000,000 a year and is estimated to have increased oil and gas values some $60,000,000 to date.

We have just had the first decisions on the Robinson-Patman Law from the F. T. C. and have commented upon them in an editorial in this issue. Just a year ago this law was passed and in our August 1936 issue we said:

> Does an unpaid charge for returnable containers become a "rebate"? Are technical services rendered a new buyer of the same character as "spiff" paid to the department store demonstrator? If a local distributor makes up Javelle water and sells T.S.P. to janitors is he a jobber, or a manufacturer, or a retailer, or a consumer? Scores of such questions plague us all and we have brought together in this issue three carefully selected articles which set forth the past, the present, and the future of this important and difficult piece of federal legislation.
>
> The array of competent legal authority which various chemical trade groups have consulted agrees that practically every chemical sales contract now in force has ceased since June nineteenth to be a proper legal instrument. This measures the readjustments that must be made. But while struggling through the details of the law, it will be wise to cast a glance at its broader implications, for if this law is not workable, we may be sure it will be followed up with similar legislation of the same intent.
>
> An unforeseen but important result will be a radical move in the focal point of chemical selling from price, which has been the chief argument and now which becomes incidental. A strong impetus will be given to "open prices" and the tendency in the future will be to change the basic quotation rather than to juggle the discounts. It would also appear likely, in the present state of most chemical markets, that differentials on l-c-l quantities will be raised. There is a new emphasis on selling costs, and this will have a direct bearing upon both freight equalization and the local distributor. There is plenty of material here to make a very radical revision of chemical sales methods and policies.

Some of these questions are still with us: some of these effects have already been observed.

Coming Next Month

"The Aniline Family" by Dr. August Merz—the story of the chemical accomplishments of the sons and daughters of the most important coal-tar intermediates, with a table of aniline derivative uses.

"Technical Chemical Sales Service"—from the viewpoint of two buyers, the purchasing agents of Goodyear and American Hide and Leather, G. E. Price, Jr., and F. A. Hayes.

"The Versatile Stearates" by J. A. Singmaster, Jr., Mallinckrodt, properties that suggest new uses of special stearates.

Wanted: Dead or Alive! Reward Five Dollars!

We want candid camera shots of chemical people, plants, and products to publish in our "Roto Section," and invite the amateur photographers of the industry, whether they have an fI.5 Contax or a Brownie Box to send us glossy prints, at least postcard size, for reproduction. The best print of the month will receive a prize of five dollars.

Salutations to Carleton Ellis. He has come nigh onto his seven hundredth U. S. patent which he ought to pass before the end of the year. A sketch of the life of this good customer is printed in the July issue of the "Journal of the Patent Office Society."

The *ne plus ultra* of research has always seemed to us to be the classic studies on the formation of holes in Swiss cheese, but we are mightily impressed with the painstaking work done by Schimmel & Company on the solvents and plasticizers used in nail enamels. No less than fifteen solvents have been time-studied for evaporation and the suitable plasticizers are reported to be resorcinol, diacetate, triacetin, diethyl glycol, triphenyl phosphate, tricresyl phosphate, and butyl stearate.

No joking at all—this kind of detailed, fine point service to consumers is one reason why chemical sales expand.

And just to show the length to which an alert, aggressive chemical salesman will go to increase the market for his products—every noon since John Chew went into the essential oil business, he has been eating six or eight of the after dinner mints that nestle coyly beside the historic grandfather's clock outside the Chemist's Club main dining-room.

Fifteen Years Ago

From our issues of August, 1922

C. C. Concannon, appointed assistant chief, Chemical Division, Department Commerce, will take office Sept. 1.

D. H. Killeffer becomes editorial representative of *I. & E. C.*

T. Coleman du Pont nominated U. S. Senator.

Frank S. Washburn succeeded by William B. Bell as president of American Cyanamid.

H. Gardner McKerrow resigns from National Aniline to engage in textile publicity work.

Air Reduction takes over plant sites in Milwaukee, Pittsburgh, and Birmingham and will begin construction at once.

SODIUM PHOSPHATE

Mono Sodium Phosphate • Tri Sodium Phosphate
Di Sodium Phosphate • Tetra Sodium Pyro Phosphate

First production in America . . . at Carteret, N. J. . . . before 1890. . . then as now, of assured quality and uniformity.

Today's production squarely meets today's demands in efficiency standards and dependability.

Tetra Sodium Pyro Phosphate (sometimes known commercially as Alkaline Pyro) is perhaps what you have been seeking in the way of a "special" phosphate. It softens water in a different way. It converts the "hardness" into a non-precipitable form.

STANDARD WARNER CHEMICALS EST. 1886

Other
"WARNER-WARRANTED"
Chemicals

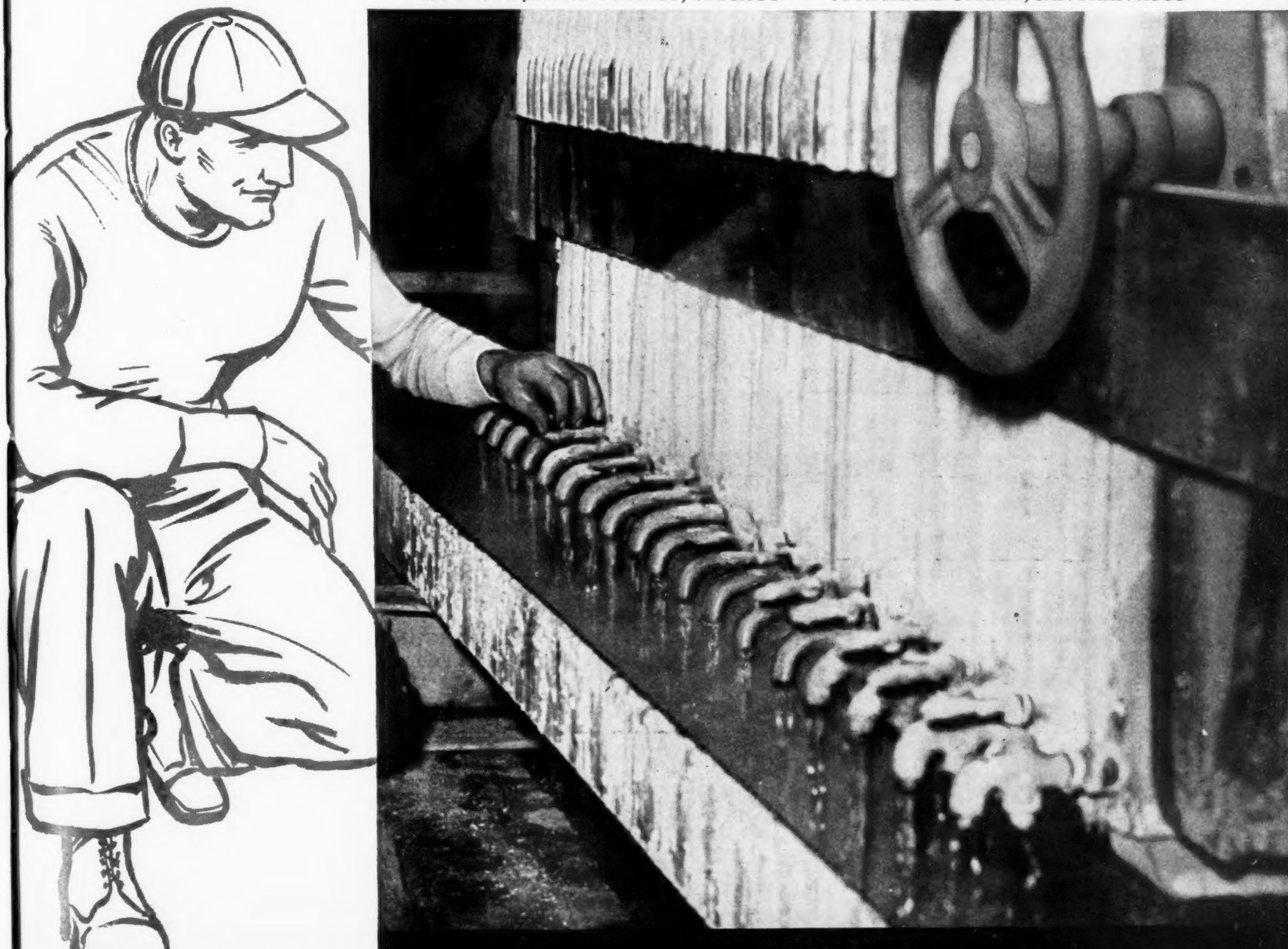
- Acid Phosphoric
- Aluminum Hydrate
- Barium Peroxide
- Blanc Fixe
- Carbon Bisulphide
- Chlorine, *liquid*
- Caustic Soda, *liquid*
- Caustic Soda, *solid*
- Caustic Soda, *flake*
- Hydrogen Peroxide
- Sodium Hypochlorite Solution
- Carbon Tetrachloride
- Sodium Sulphide
- Sulphur Chloride, *yellow, red*
- Water Treating Compounds

An opportunity is sought to submit quotations and samples

WARNER CHEMICAL COMPANY

Pioneer Producers since 1886

CHRYSLER BUILDING — NEW YORK CITY
155 EAST SUPERIOR STREET, CHICAGO • 70 RICKARD STREET, SAN FRANCISCO



Division of
WESTVACO CHLORINE PRODUCTS CORPORATION